

OCT 24 1938

# AUTOMOTIVE INDUSTRIES

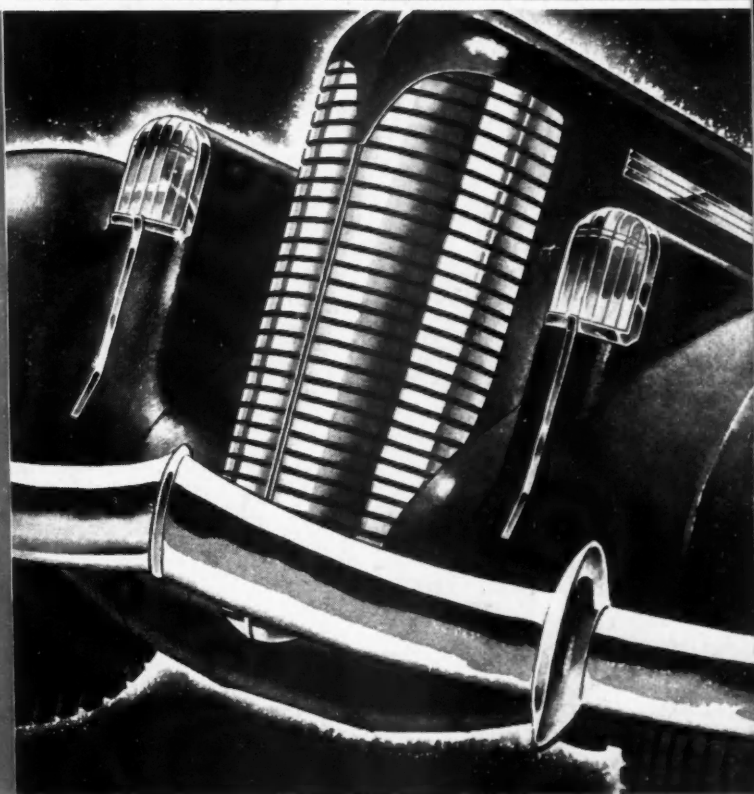
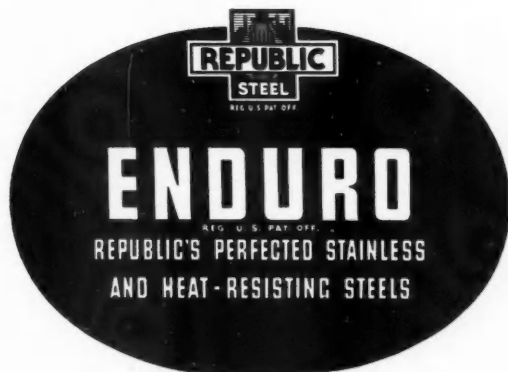
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OCTOBER 22, 1938

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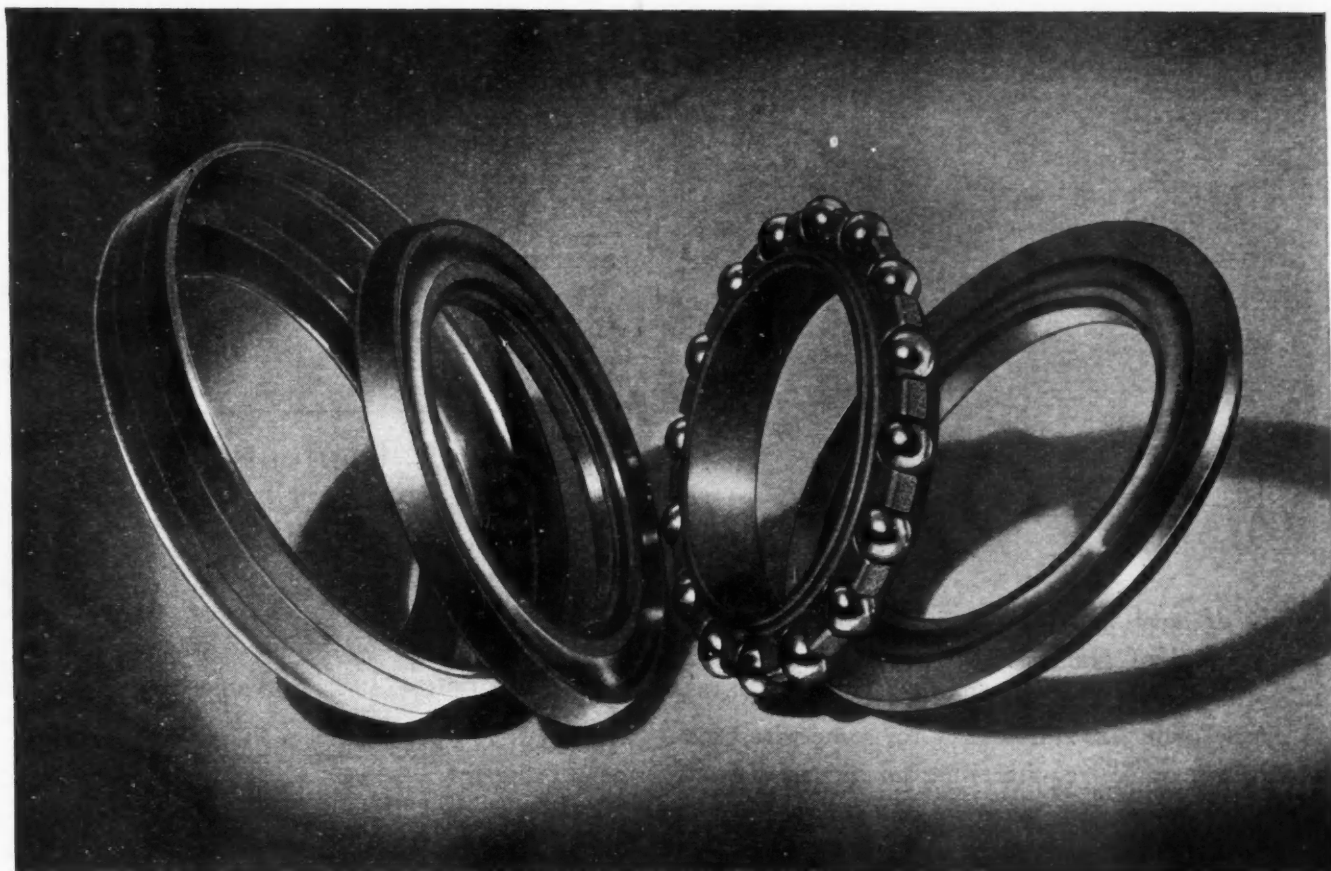
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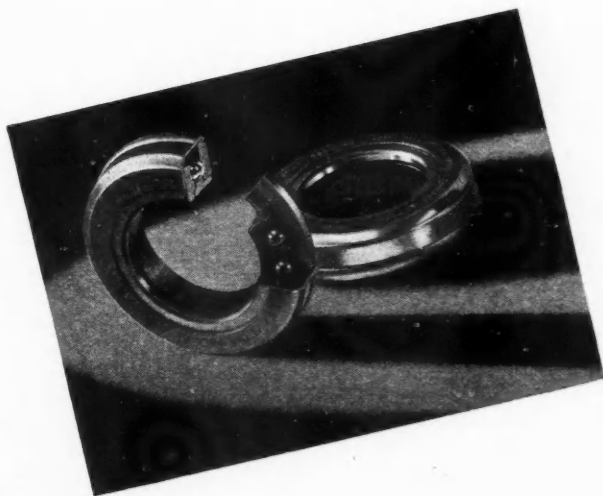
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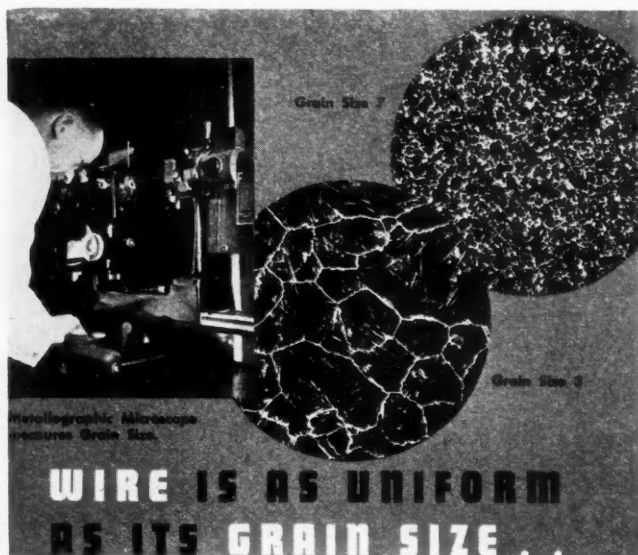


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October 22, 1938

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# AUTOMOTIVE INDUSTRIES

## THE AUTOMOBILE

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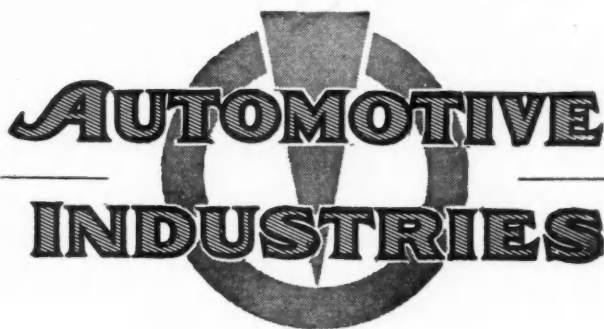


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## News of the Industry

### SHOW TIME AMERICANA

● Slogan-trouble beset the National Automobile Show a few weeks ago. The first slogan chosen was regarded as unacceptable to labor interests and was discarded after some of the murals incorporating it had been prepared. The new slogan is regarded as being duller, but safer.

● Time, Inc., will again sponsor and produce the official program of the National Automobile Show, opening in New York, Nov. 11. The magazine *Life* will publish its long-awaited photogenic analysis of the automobile industry in an automobile show issue dated Nov. 14. "Photogenic" is *Life's* word for the type of story that *Life* has glorified; a story which can be told—and interpreted—in pictures.

● The Port Authority Building in New York, site of this year's Truck Show, will be out of circulation as an exhibition building at show time next year, according to informed sources. Most of the exhibition space has been taken over by a book publishing firm for shipping and warehousing. Perennial question "why isn't the National Automobile Show held in the Port Authority Building?" is thus, finally, answered by default.

### RFC LOAN TO BANTAM

● The Reconstruction Finance Corp. has approved a loan of \$275,000 to the American Bantam Car Co., Butler, Pa., according to an RFC report. Francis H. Fenn, Bantam vice-president and general manager stated that the loan would not be used for expansion but simply to improve the company's working capital position.

## Production

### Optimism Reigns As Working Forces And Output Are Increased

News from the automotive front continued its optimistic trend during the past week as leading producers announced substantial additions to their productive working forces which were reflected in another healthy increase in car and truck output and promised still higher schedules for the balance of October.

Car and truck production for the week ending Oct. 22 would exceed 60,000 units, it was indicated by a mid-week check of factory schedules. This compares with a revised total of approximately 45,000 units during the preceding week and should bring the total for the month to date over the 130,000 mark. On this basis the industry should easily make October considerably better than a 200,000-car month.

Although the current production rate has not yet equalled that of the corresponding period a year ago, continued sharp upward revisions are expected over the next few weeks. If the early interest shown by dealers and car buyers in 1939 models is maintained, as leading executives now expect it will be, the final quarter of the current year should account for close to one million new cars and trucks.

According to the mid-week check, General Motors divisions were expected to account for more than 27,000 cars and trucks, the various Chrysler divisions for more than 13,000 and Ford for close to 9000.

Nash which barely started finishing cars during the preceding week had succeeded in turning out new models at an increased rate during the current week. Graham also began final assemblies this week. This left only Willys and Hupmobile, among the car manufacturers, who were not yet actually completing and delivering 1939 models.—J. A. L.

## AUTOMOTIVE INDUSTRIES

### Summary of Automotive Production Activity (Week Ending Oct. 22)

**BUSES** Manufacturing activity remains virtually unchanged and very few producers incline to the view that a sudden upturn is imminent. Although under 1937 totals, bus business this year on the whole has been good. More than 500 cities have bus service, either augmenting or taking the place of trolley systems, and a number of other systems have been making inquiries. Some replacement of equipment wrecked or damaged in the recent hurricane has been reported along the north Atlantic coast from Charleston to Montreal.

**TRUCKS** Consensus of representatives of leading companies is that conditions in this field are very slowly, but definitely improving. One sales manager reports gleefully that his entire supply of proposal forms was recently appropriated by the engineering department. "A good sign," he said. Generally, sales are at low ebb, pending the opening on Nov. 11 of the National Truck Show in New York.

**TRACTORS** On the whole, sales are better than last year. One company has averaged nearly 6800 units each month since the middle of the summer. A number of organizations report that recent price reductions have had a stimulating effect on sales.

**AUTOMOBILES** Solid food for optimists this week; announcements of substantial additions to productive working forces by leading producers and further increase in car and truck output. For the week ending Oct. 22 AUTOMOTIVE INDUSTRIES estimates cars and truck production exceeding 60,000 units. It appears that the industry will do better than 200,000 this month.

**MARINE ENGINES** In the East, little increase in business as a result of the devastation to motor boats by the recent hurricane has been reported. General Diesel engine publicity, however, has increased the number of inquiries about this type of powerplant from prospective boat owners. No upturn is anticipated before the National Motor Boat Show, Jan. 6, in New York's Grand Central Palace.

**AIRCRAFT ENGINES** Further stimulation of output has resulted from the British rearmament program, using Canadian aircraft with American-manufactured Canadian-assembled engines. Experimental work in the major engine factories has been stepped up as a result of the requirements of the American army and navy.

*This summary is based on confidential information of current actual production rates from leading producers in each field covered. Staff members in Detroit, Chicago, New York and Philadelphia collect the basic information, in all cases from official factory sources.*

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## News of the Industry

### REGISTRATIONS RECEDE

• New passenger car registrations in 26 states in September totalled 30,158 to slump 32.44 per cent below registrations in the same states in August, R. L. Polk & Co. reports. This 26-state figure is 56.61 per cent below the 69,511 registrations reported in the same territory in September of last year, according to Polk records.

New truck registrations in 27 states in September total 9951 compared to 13,528 in August and 19,627 in September of last year. This represents registration decreases of 49.29 per cent from September, 1937 registrations and 26.44 per cent from August figures.

### CRYSTAL GAZER

• When the president of the National Machine Tool Builders' Association "looks into the crystal ball," what does he see?

"The processes of invention have not stopped; we are constantly widening our search for better ways to do things. We see no single opportunity that will lead to another industrial giant like the automotive industry, but there are a host of new things that will find their way into the market as soon as the outlook improves and investors are willing to put their idle funds to work." Words by Howard W. Dunbar, vice-president of the Norton Co. and president of the NMTBA. Scene: NMTBA convention (the thirty-seventh) at Hot Springs, Va., Oct. 17.

### CAPISCE ITALIANA?

• Come la pensano gli utenti sulle automobili del giorno d'oggi?, or, in other words, what do automobile buyers think about today's cars. The Italian for it is supplied by *AutoMotoArio* (Milan), which in its issue of Sept. 30 devotes a long abstract to Mr. MacGowan's articles which appeared recently in *AUTOMOTIVE INDUSTRIES*.

### ACTIVITY ABROAD

• The sale of automobiles of German manufacture during the first half of the current year showed an increase of about 6 per cent over the figure for the corresponding period of the previous year, from 135,723 to 143,320. Sales in the home market showed a slight decrease (1.4 per cent) but export sales increased 30 per cent over the first half of 1937.

• The production of cars of up to 12 hp. in Italy, which in 1936 attained an average monthly figure of only 1989, reached an average of 3518 in 1937 and the following values for the first four months of the current year: January, 3719; February, 3569; March, 4067; April, 3709. As regards cars of 12-25 hp., the registration was 1455 in January, 1167 in February, 1366 in March, and 1272 in April. This production was absorbed for the most part by the domestic market, automobile exports during the period January-May 1938 having amounted only to 7687 cars valued at 93.51 million lire, as compared with 11,788 cars valued at 296.01 million lire during the corresponding period of the previous year.

• Production of automobiles in Canada fell to a low ebb during September, a total output for Canada of 6089 units, the year's low point, as compared with 6452 units in the previous month and 4417 units in the corresponding period of 1937. Pending the introduction of the new models for the following year, production usually reaches a low point in September, rising

steadily thereafter, in relation to the demand for the new models. During September output of passenger cars was reported at 4290 units and commercial vehicles at 1795. Of these totals 3004 passenger cars and 666 trucks were made for sale in Canada with the balance being intended for export.

• According to Attila Castro, managing director of Studebaker's distributing firm in Brazil, the unusually favorable economic conditions there indicate that 1939 will be a boom year. Mr. Castro came to the Studebaker factory on a hurried visit to place an order for new models. "Even now general business activities backed by a most favorable economic situation and a popular government, are on a speedy upturn," Mr. Castro said. "People have money and are buying."

### RUBBER CONSUMPTION SHRINKS

• Consumption of crude rubber by manufacturers in the United States during the month of September, 1938, is estimated to be 37,823 long tons, a decrease compared with 38,170 long tons during August, 1938. September consumption shows a decrease less than one per cent under August and is 13.93 per cent under September a year ago according to statistics released by The Rubber Manufacturers Association. Consumption for September, 1937, was 43,945 (revised) long tons.

Gross imports of crude rubber for September are reported to be 37,374 long tons, an increase of 20.2 per cent over the August figure of 31,099 long tons but 33.3 per cent under the 56,049 long tons imported in September, 1937.

Total domestic stocks of crude rubber on hand Sept. 30 are estimated at 276,586 long tons, which compares with Aug. 31 stocks of 277,463 long tons and 186,193 long tons on hand Sept. 30, 1937.

Crude rubber afloat to United States ports as of Sept. 30 is estimated to be 48,927 long tons which compares with 47,772 long tons afloat on Aug. 31 and 83,288 long tons afloat on Sept. 30 a year ago.

September reclaimed rubber consumption is estimated at 11,281 long tons, production 12,016 long tons, stocks on hand Sept. 30, 18,127 long tons.

### IN THE TIRE FIELD

• On the Akron campus Goodyear Tire & Rubber Co. tire builders and rubber workers were urged by officials of the URW at a rally held Oct. 16 to "get back some of the sitdown spirit without the sitdowns." Lamented Wilmer Tate, president of the Akron Industrial Union Council, CIO central body. "The labor movement in Akron has become too respectable in the last year and a half."

• The plan of reorganization of Seiberling Rubber Co. of Canada, Ltd., Toronto, Ont., approved by shareholders recently, has been sanctioned by the courts and supplementary letters patent received. As a result, preferred shareholders are now being asked to surrender their stock for exchange. Under the plan all preferred stock and accrued arrears of dividends are cancelled. In exchange three common shares will be given for each preferred share.

Seiberling Rubber Co., Akron, Ohio, holds all the common stock of the Canadian company as well as 1481 preferred shares. The parent company has agreed to donate 10,557 of its common shares which will be distributed to the holders of the balance of the 5000 preferred shares on the three for one basis.



WILLIAM O'NEIL

... president of the General Tire and Export Co., Akron, was one of many travelers returning from Europe on the liner *Nieuw Amsterdam* which docked in New York, Oct. 15.

## Tire Prices Lifting

### Major Manufacturers Make Upward Adjustments on Certain Sizes

As a possible forerunner of a general tire price advance before the industry's 1938-1939 spring-dating program goes into effect Nov. 1, major tire manufacturers have adjusted prices upward on a selected number of passenger car tire sizes and a few truck tire sizes. The price increases range from 2 to 5 per cent, and in the passenger car field apply only to smaller tire sizes that are no longer among the leaders as to relative popularity. These sizes include 4.40, 4.50, 4.75 and 5.00-in. casings in all lines, both four and six-ply. Truck tire price advances cover the 5.00, 6.00, 7.00, 8.00, 8.25, 9.00 and 10.50-in. sizes and the 5.50-20, 6.00-20, 7.50-20, 7.50-24 sizes. Tube prices are not changed. First company to announce the increase was United States Rubber, with its new lists out Oct. 11. Goodyear and Goodrich followed suit Oct. 17.

The spring-dating program, providing for deferred payments on shipments after Jan. 1 on orders solicited starting Nov. 1, carries a clause protecting dealers against price decline for six months, or until May 1. Thus spring dating has virtually the effect of "freezing" prices for the ensuing six months.

Manufacturers report that August and September replacement sales ran substantially ahead of a normal or



average seasonal pace, and that October sales so far have been exceptionally strong. The industry now confidently expects to see total replacement sales for the year equal to those of last year, and to exceed 29,000,000 units. Inventories of finished tires are down considerably from a year ago. Original equipment orders have been increased as car makers push production on their new 1939 models. Total primary sales, however, will scarcely exceed 11,000,000 units for the year, against more than 22,500,000 in 1938.

## FTC Files Ford Brief

### *Cease and Desist, Order Recommended in "Six Per Cent Case"*

The Federal Trade Commission's long-delayed brief in the so-called 6 per cent case against the Ford Motor Co. and the Universal Credit Corp. was filed late last week. A similar case against the General Motors Corp. is pending before the FTC but the trial examiner's report has yet to be made.

James M. Hammond, FTC trial attorney, recommended that the Ford company be ordered to cease and desist from the alleged practice of advertising a plan of financing deferred payments on its automobiles at 6 per cent simple interest. The brief charged that the actual interest under the plan amounted to "slightly less than 12 per cent interest" and added that alleged deception to the public was further aggravated by furnishing dealers with order blanks which, according to the brief, did not show precisely what the charge was under the 6 per cent plan, and which, it was alleged, might have been used to compute interest at a much higher rate without the purchaser becoming aware of that fact.

To the argument that the sale of a motor vehicle is a local matter and is not "commerce" under the jurisdiction of the Federal Trade Commission, the FTC brief replied that the law is well settled that it is unnecessary for the respondent to sell directly to the public in order to come under the law's jurisdiction.

The Commission's brief added that to permit respondent to use the 6 per cent plan would constitute "an injustice which should not be tolerated by the Commission." It was explained that orders to cease and desist have been issued by the FTC against practically the entire automobile industry because of similar financing methods and that such manufacturers "must be protected."

## Export "Bugs" to Be Microscoped

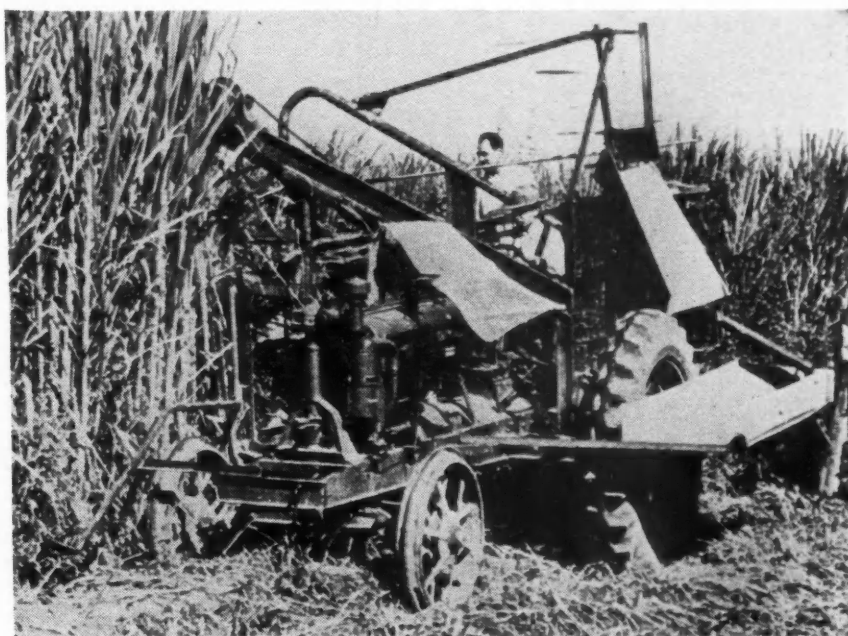
### *Varied Problems of Automotive Export Business to Be Examined at National Foreign Trade Council Convention*

Varied problems pertaining to the export of automobiles and automotive products will be "put under the microscope" of discussion by automotive exporters, government officials and shipping representatives at a special meeting on Nov. 1, during the annual convention of the National Foreign Trade Council, at the Hotel Commodore, New York. Chairman of the meeting will be J. F. Kelly, Jr., president of the Overseas Automotive Club, Inc., and export manager of the Electric Storage Battery Co. Secretary of the meeting will be Irving H. Taylor, chief of the automotive division of the Bureau of Foreign & Domestic Commerce. Plans and program of the meeting are being worked out, cooperatively, by the Overseas Club, Mr. Taylor and George F. Bauer, secretary of the foreign trade committee of the Automobile Manufacturers Association. Participating also are A. H. Eichholz, general manager of the Motor & Equipment Manufacturers Association, and R. W. Procter, secretary of the manufacturers group of the National Standard Parts Association.

A number of Washington officials, according to announcement by Mr.

Taylor, will be present during the afternoon session. Included are Harry C. Hawkins, chief of the Trade Agreement Section, Department of State; Dr. Henry F. Grady, chairman of the Committee for Reciprocity Information and vice-chairman of the U. S. Tariff Commission, and Warren Lee Pierson, president of the Export-Import Bank. Officials of the Bureau of Foreign & Domestic Commerce, in addition to Mr. Taylor, will be Grosvenor M. Jones, chief of the Finance Division; Henry Chalmers, chief of the Division of Foreign Tariffs; Frank Eldridge, chief of the Commercial Intelligence Division, and H. Coit MacLean, special service officer.

Discussion leaders, representing the industry, are now being chosen, but will include Edgar Smith, vice-president of the General Motors Overseas Operations; V. A. Dodge, of Dodge & Seymour, Ltd., New York; P. A. Karl, export manager, Brunner-Aro-Globe, Utica, N. Y.; R. L. Vaniman, of the Export Division of Chrysler Corp.; W. H. Lukens, export manager, R. M. Hollingshead Corp., and Arvid L. Frank, president of Studebaker Export Corp. Others will be announced later.



**BEAT** While the Bureau of Agricultural Engineering in Washington was seeking a \$75,000 appropriation for "preliminary" study for plans of a mechanical sugar cane harvester, Allan Ramsey of Louisiana

beat them to it by announcing the completion of his machine. He set the cost at \$500. In its initial test the machine cut through a field of 12 ft. cane, topping, stripping, and bunching at the rate of a ton every three minutes.

International

## News of the Industry

### WHAT ARE THEY DOING?

**WILLIAM E. HOLLER**, general sales manager of Chevrolet, completed five years in that position on Oct. 17. In the middle of the week appeared No. 7 of Vol. 1 of "Chevroliet," which gives printed form monthly to Mr. Holler's Chevroliet personality, and the 1939 line was announced Oct. 22 (see page 498). It was a big week for Mr. Holler, who rides a horse for relaxation.

**JOHN D. TEBBEN** has been appointed sales manager of the metallurgical division of P. R. Mallory & Co., Inc., Indianapolis, Ind.

Promotion of three men has been announced by the AC Spark Plug division of General Motors Corp. **PAUL W. RHAME** is the new general manufacturing manager, **JOSEPH A. ANDERSON** becomes assistant general manufacturing manager, and **EDWARD D. ROLLERT** becomes process engineer.

**A. G. PARTRIDGE**, president, Goodyear Tire & Rubber Co. of Canada, Ltd., has been elected president of the Rubber Association of Canada, following the recent annual meeting of the association at Toronto. **J. I. SIMPSON**, of Dunlop Tire & Rubber Goods Co., Ltd., is vice-president.

**R. T. HENDRICKSON**, president of the Hendrickson Motor Truck Co., has been elected chairman of the motor truck manufacturers section of the Chicago Automobile Trade Association.

Three new directors were added to the board of Fairchild Aircraft, Ltd., Montreal, at the annual meeting. **SHERMAN M. FAIRCHILD** and **E. R. ROBINSON**, of New York, resigned, while **E. G. JACKSON**, Montreal, died during the year. In their place shareholders elected **P. S. GREGORY**, assistant general manager of Shawinigan Water & Power Co., Ltd.; **LEO G. RYAN**, president of Mallinckrodt Chemical Works; **W. TAYLOR-BAILEY**, vice-president Dominion Bridge Co., Ltd. Other directors were re-elected. It was explained at the meeting that the resignation of Messrs Fairchild and Robinson was desirable in order to have an all-Canadian board, as the company is involved in work for the Dominion of Canada Government and may eventually be carrying out work for the British Air Ministry.

**YALE D. HILLS** has been made manager of distribution sales for the service-sales division of The Timken Roller Bearing Co. For several years he has been manager of the Los Angeles territory branch of the company.

**LEE M. CLEGG**, executive vice-president of Thompson Products Co., Cleveland, was elected a member of the Corporation and the board of trustees of Case School of Applied Science on Oct. 12. **DR. ZAY JEFFRIES**, president of the Carboly Co., also was elected a member of the corporation.

**DONALD P. HESS**, president of the American Bosch Corp., Springfield, Mass., sailed for Europe Oct. 18 on an extensive business trip in the interests of the corporation. Mr. Hess will visit England, France, Germany, Sweden, Holland and Switzerland, returning to this country about Dec. 1.

### AUGUST FINANCING DIPPED

● Automobile financing tumbled approximately 32 per cent in August as compared with the July figure of \$61,279,684. The August, 1938, total of \$41,845,317 trailed by more than 74 per cent the \$161,539,141

marked up August a year ago. Wholesale financing for the first eight months of the year aggregated \$604,387,861, roughly 56 per cent as compared with \$1,374,979,848 during the same months of 1937.

Retail financing was reported at \$42,101,807, compared with \$40,880,178 in July and \$99,000,881 in August of last year. Retail financing for the first 8 months amounted to \$342,515,424 compared with \$778,101,203 during the corresponding months of last year.

● "It is probable that the retail business of sales finance companies covering other kinds of goods amounts to about one-third of the automobile business, with an even much smaller ratio for wholesale," according to Milan V. Ayres, secretary of the National Association of Sales Finance Companies, writing in the October issue of *Sales Financing*.

### PUBLICATIONS AVAILABLE

"Bearings, bushings and bearing metals for industrial application" is the title of a booklet just issued by the Federal-Mogul Corp., Detroit.\*

The 1939 catalog issued by the Bunting Brass & Bronze Co., Toledo, lists hundreds of different sizes of completely machined bronze bearings. Bunting's lines of cored and solid bars of bronze bearing metal, lead base and tin base Babbitt, and other special products are described. The book also contains data on oil grooving, graphiting and special operations in bearing manufacture.\*

Arc welding equipment and supplies are described in an 8-page illustrated booklet published by Westinghouse Electric & Manufacturing Co. A brief description, style number and price are listed for such items as helmets, lenses, cover glass, electrode holders, protective clothing, miscellaneous accessories and welding publications.\*

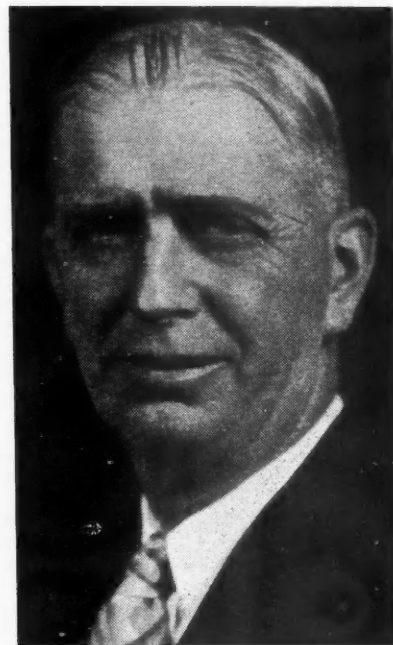
\* Obtainable from editorial department, AUTOMOTIVE INDUSTRIES. Address Chestnut and 56th Sts., Philadelphia.

### BOOM ERA IN AIRCRAFT

● Douglas Aircraft Corp. delivered in September over \$1,800,000 worth of transport and military type aircraft to the United States, foreign governments, and airlines. Douglas' backlog of unfilled orders is now \$25,400,000.

● The Lockheed Aircraft Corp., Los Angeles, Calif., has signed a contract with the British Air Ministry for the largest spare parts order ever received by the company. The contract, calling for \$3,900,000 of extra equipment, will complement the order received by Lockheed last June from the British government for 200 reconnaissance bombers costing approximately \$18,000,000. Lockheed also has been awarded an order by the Colonial Department of The Netherlands' East Indies for 12 high-speed transports.

● Ryan Aeronautical Co., San Diego, Calif., and its wholly owned subsidiary, Ryan School of Aeronautics, showed gross income of \$429,486 for the first eight months of this year. Compared with \$295,120 for the corresponding period of 1937, this is an increase of 45 per cent. Net profit for the period was \$31,451, against \$18,995 for the entire year 1937 and \$4223 for the full year of 1936, all before Federal income tax. Net for the eight months' period this year is equal to approximately 11.3 cents a share on the 269,650 shares of stock outstanding. Current backlog shows business booked in an amount totaling over \$300,000.



J. S. ERSKINE

... International Harvester Co. engineer who was recently nominated to the Society of Automotive Engineers' Council for 1939 as vice-president, Tractor and Industrial Power Equipment.

## To Study Legislation

### Nine Trade Associations Asked To Participate in "Clearing House"

Nine national trade associations directly interested with the production, financing and sales of motor vehicles, tires, parts, and accessories, have been invited to name representatives to serve on a basic committee of the Motor Vehicle Industries Conference, now being organized to serve as a clearing house for gathering and disseminating information relating to proposed legislative activities in various states which may affect the industry.

About 60 national trade associations are identified with the automotive industry, and they will be called upon for whatever information they can provide.

State legislation touching upon anti-trust, resale price maintenance, labor relations, selling below cost, etc., will be reported to the Conference, which in turn will report the status of bills and enacted laws to the various trade associations interested. Forty-four state legislatures will convene in January, 1939.

The nine associations which have been asked to name representatives to serve on the basic committee are: American Finance Conference, Automobile Manufacturers Association, Automotive Parts & Equipment Manufacturers, Inc., Motor & Equipment Manufacturers Association, Motor &



Equipment Wholesalers Association, National Association of Finance Companies, National Automobile Dealers Association, National Standard Parts Association, Rubber Manufacturers Association.

The membership committee consists of David C. Fenner, vice-president of Mack International Truck Co., and former chairman of the Motor Vehicle Conference Committee, chairman; Rodney Dean, American Iron & Steel Institute; A. H. Eichholz, Motor & Equipment Association; Bond P. Geddes, Radio Manufacturers Association; and J. H. Myerson, National Association of Sales Finance Companies.

## Form New Truck Group

*Association Aims to Represent All U. S. Private Owners*

A new automotive trade association, the National Council of Private Motor Truck Owners, aiming to represent nearly six-sevenths of the truck owners of the country, is being organized as a fact-finding association. The movement was heartily endorsed this week by representatives of midwest industries and farm groups.

Of the 4,255,000 trucks registered in the United States, only about 655,000 are represented in the various "for hire" trucking associations. Interests of the owners of fleets and individual trucks who operate some 3,600,000 units as an incidence to their own businesses have not had adequate representation in the form of a trade association, leaders of the new movement say.

The midwestern group criticized efforts to "reestablish a monopoly in transportation" by proposals in various States and in Washington to place motor trucks owned by industrial organizations and by farmers in the same category as "for hire" transportation agencies by arbitrary regulation and taxation under the jurisdiction of utility commissioners.

## General Motors to Reemploy 35,000

*Sloan Announces Rehiring Program and Restoration of Salary Levels Existing Previous to Reductions Made Last February*

Reemployment by General Motors of approximately 35,000 additional workers within the two weeks' period dating from Oct. 18 was announced on Tuesday by Alfred P. Sloan, Jr., chairman of the corporation. At the same time, Mr. Sloan announced that there will be a restoration of the salary level existing previous to the reduction made last February.

The salary readjustment will take the form of restoring the compensation of those receiving \$300 a month or less to the level existing on Feb. 28, 1938, when the reduction became effective. Those receiving more than \$300 a month will be adjusted on an individual merit basis. This will be made effective as of Nov. 1 and applies to domestic operations only.

"The number of workers now being reemployed," said Mr. Sloan, "is the maximum number to whom it is felt adequate employment can be given during the year as judged by today's outlook. The corporation recognizes its responsibility, not only in its own interest but in the interest of its workers and of the national economy as a whole, to provide as much work as it possibly can and to allocate the amount of work available so that it will produce the most beneficial results to the individual employees as well as to the community as a whole.

"To assist in carrying out its stabilization of employment program, the corporation will again build substantial inventories in excess of retail demand during the winter months, thus giving more hours of employment to the working force and at the same time preparing for the seasonal increase in business which occurs every spring."

The New Deal is as happy as a boy with his first pair of suspenders over the General Motors announcement of reemployment of 35,000

workers and restoration of wage slashes. In some quarters, where ordinarily "big business" is made a favorite source of condemnation, scoffing gave way to praise for General Motors whose action was hailed as a precursor to widespread recovery.

Secretary of Commerce Roper waxed unusually enthusiastic, and said that "The resumption of production schedules by the automobile industry is an outstanding illustration of this trend (general business improvement) to a gradual broadening of the recovery base."

## Diesel Powered 3-Ton Truck Announced by Dodge for '39

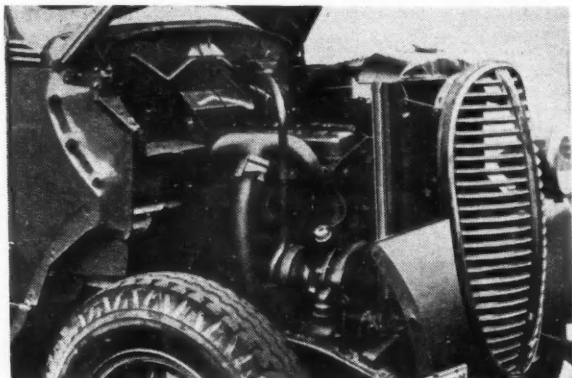
Dodge Truck Division of Chrysler Corp., will enter the oil burning engine field in 1939 with a Diesel 3-ton truck.

The new Dodge Diesel engine has full length water jackets, a by-pass thermostat, chain driven camshaft, precision type bearings, full pressure lubrication and aluminum alloy pistons. It has a 4-cycle, 6-cylinder engine having 331 cu. in. displacement. The bore is 3¾ in., the stroke 5 in., the crankshaft has 7 main bearings. The engines will be manufactured in the Dodge plant.

## Hercules Diesel "Power Package" Offered for Ford Trucks

Departing from its traditional policy of supplying engines primarily for original equipment, the Hercules Motors Corp., Canton, Ohio, announced this week a "power package" for converting Ford truck units to Diesel operation.

The engine on which the conversion is based is a Hercules 4-cylinder Diesel, Model DOOC, 4 in. by 4½ in.; displacement 226.2 cu. in. (3.71 liters). The engine supplied will fit the standard Ford engine mountings on all V-8 truck chassis from 1935 to 1939 inclusive, and is intended for use with the standard V-8 passenger car muffler assembly and a 12-volt battery of ampere rating and outside dimensions specified in the installation instructions. Wiring harness, and other necessary parts, except the battery and muffler are supplied with the engine. The manufacturer claims that no changes are necessary in the Ford dash or chassis.



## POWER PACKAGE

Hercules Motors Corp. is shipping in a single box its 4 in. by 4½ in. Diesel engine with all the parts and instructions necessary to install it in Ford truck chassis, 1935 to 1939 models inclusive, right or left hand drive. Picture shows a 1938 Ford chassis with the Hercules engine mounted.

## News of the Industry

### GM EXPORTS OFF SLIGHTLY

• Sales of General Motors cars and trucks to dealers in the overseas markets during September totaled 27,608 units, representing a decline of 8.3 per cent from sales in September of last year. In the first nine months of 1938, sales of 273,599 units represented a decline of 1.1 per cent from sales in the first nine months of 1937. For the 12 months through September, 1938, sales totaled 360,583 units—an increase of 2.0 per cent over the volume in the 12 months ended Sept. 30, 1937.

• The Ferracute Machine Co., Bridgeton, N. J., has opened an export department at 44 Whitehall Street, New York, which will handle the entire line of power presses manufactured by the company for certain important foreign countries. Stanley H. Rose is export manager in charge of foreign sales.

### BRAKE LINING MAKERS ELECT

• The Brake Lining Manufacturers' Association at its annual meeting, Sept. 28, 1938, in New York City, elected the following officers for the coming year: E. S. Crosby, Johns-Manville Corp., president and member of the executive committee; T. L. Gatke, Gatke Corp., first vice-president and member of the executive committee; W. C. Dodge, Jr., Ferodo and Asbestos, Inc., second vice-president and member of the executive committee; J. S. Crawford, Johns-Manville Corp., treasurer and member of the executive committee; C. A. Ekwall, secretary, general manager and assistant-treasurer. Additional members of the executive committee include: F. E. Schluter, Thermoid Co.; F. J. Bowers, Scandinavia Belting Co.; R. B. Davis, Raybestos division of Raybestos-Manhattan, Inc.; H. A. Gillies, American Brakeblok division of American Brake Shoe & Foundry Co.; and H. D. LaMont, Asbestos Mfg. Co.

### TO MAKE AIRCRAFT DIESELS

• A new company in Buffalo which will manufacture Diesel engines for airplanes has received a certificate of incorporation. It is the Trans-America Aircraft & Motor Corp. which has rented space in the old Consolidated Aircraft Corp. plant.

Production of an experimental engine, which will be submitted to the U. S. Department of Commerce for testing, will begin shortly, according to Charles A. Balton, vice-president of the new company and designer of the engine.

The new engine, which has been designed to deliver a maximum of 164 hp. will weigh around 200 lb., according to Mr. Balton. There are no 200-lb. gasoline engines for comparisons, he declared, but one gasoline engine weighing 150 lb. delivers only 50 hp.

President of the new concern is Richard Benson, also president of Niagara-From-the-Air, Inc.

### CHRYSLER ACQUIRES MORE ACRES

• Chrysler Corp. has purchased 65 acres of land just beyond the city limits of Newark, Del. While no plans for building on the newly acquired site have been announced, it is believed that the ground will be used for an Eastern parts depot base.

• Nearing completion at the Saginaw street plant of the Yellow Truck & Coach Co., Pontiac, Mich., is a new machine shop and engine plant which will be used for the manufacture of a group of engines which were formerly purchased completely assembled.

When present plans are completed, all

gasoline engines used in General Motors trucks and Yellow coaches will be built in this plant. The new engine plant is already in operation with 80 engines scheduled per day for October. This number is expected to be doubled in November.

• Offices of the Aviation & Transportation Corp., Chicago, formerly the Cord Corp., are to be moved to New York this month. It is said that all activities are to be transferred by Jan. 1, 1939, with a minimum organization being maintained at Chicago for the next two months.

• The de Havilland Aircraft of Canada, Ltd., Toronto, Ont., has awarded a contract to A. W. Robertson, Ltd., for extension and improvement of its plant near Toronto, at an estimated cost of \$80,000.

• The Brown Rubber Co. has purchased a controlling interest in the Composite Materials Corp. of Detroit. The latter company manufactures automobile sound-deadening materials.

### DEGREE IN WELDING OFFERED

• A new curriculum in Ohio State University's college of engineering leading to a degree in welding engineering began Oct. 4. Administration of the curriculum is under the department of industrial engineering which for a number of years has presented the shop courses in welding required by various curricula in the engineering college.

### STAND-DRIVE PATENTS UPHELD

• DiVco-Twin Truck Co. of Detroit, manufacturers of patented delivery vehicles designed to be driven by an operator in a standing position, have recently obtained further recognition of their patent rights and acknowledgments of the validity of their patents in the delivery vehicle field. Baker-Raulang Co. and the Truck Engineering Co., both of Cleveland, have discontinued the manufacture of vehicles driven by an operator in a standing position, and have compensated the DiVco-Twin Truck Co. for past infringements of its patents in the stand-drive field, and have acknowledged the validity of DiVco-Twin patents. Baker-Raulang Co. has been granted a license under patents owned by the DiVco-Twin Truck Co. for the manufacture of vehicles other than those which are driven by an operator in a standing position.

### 40 Years Ago

• Probably no concern in the country has given more careful study to the gasoline vehicle motor than the American Motor Co., of New York, who for nearly three years have been constructing special motors for this class of work. They have given particular attention to the jacketless motor, and now have perfected a small motor which runs successfully without a water jacket, and will soon have larger sizes ready. The American motors are used by many builders of motor carriages throughout the country, and are remarkable for their lightness, simplicity, high speed and perfect control, a throttle regulating the speed from 200 to 1,000 or more revolutions, like that of a steam engine. Another important feature of these motors is the electric ignition, which is perfectly reliable and durable, being based on a discovery which it required two years of painstaking investigation to make. This company now has six different styles of motors on the market.

From *The Horseless Age*, October, 1898.

## Deeds Takes New Post

### United Aircraft Executive Resigns To Head Chandler-Evans Corp.

Charles W. Deeds has resigned as vice-president and director of United Aircraft Corp. and general manager of the Pratt & Whitney Aircraft division, to become president of the Chandler-Evans Corp. which was formed recently to manufacture and develop aircraft carburetors, fuel pumps and a variety of aircraft accessories. Other officers of the new corporation are: M. E. Chandler, vice-president in charge of engineering; W. B. Groves, vice-president in charge of sales; M. E. Stover, treasurer; Prewitt Semmes, secretary; and E. J. Hill, vice-president in charge of the fuel pump department. Members of its board of directors are: E. S. Evans, Sr., chairman, president of the Evans Products Co.; E. S. Evans, Jr., vice-president of the Evans Products Co.; Frank Russell, vice-president of the National Aviation Corp.; E. O. McDonnell, president of the National Aviation Corp.; H. R. Powell of G. M. P. Murphy; George M. Gilles, Jr., Adams Express Co.; and C. W. Deeds, M. E. Chandler and W. B. Groves.

Mr. Chandler and Mr. Groves started in the carburetor business more than 15 years ago with the Stromberg Co. of Chicago, and later when this company was absorbed by the Bendix Aviation Co. they were appointed, respectively, general manager and sales manager. In 1934 they resigned to form the Chandler-Groves Co., manufacturing the non-icing carburetor now in general use on Wright Cyclone engines. The Chandler-Evans Corp. has acquired ownership of all patents covering this carburetor, and an initial order has been received from the Wright Aeronautical Corp.

The company has acquired the fuel pump division of the Evans Appliance Co., an Evans Products affiliate, and will manufacture a complete line of aircraft and Diesel fuel pumps. This fuel pump is in production and the company numbers among its customers General Motors Corp., several of the Diesel engine manufacturers and is also beginning to work on a large contract for the United States Government.

Chandler-Evans Corp. is occupying new quarters at 2200 Eighth Street, Detroit. Its capitalization is \$200,000. All of the stock is held within the board of directors and the National Aviation Corp.





Written by the Guaranty Trust Co., New York

Further quickening of the pace of business activity was reported last week. *The Journal of Commerce* index of business for the week ended Oct. 8 reached 86.8, as compared with a revised figure of 86.2 for the preceding week and with 69.8 at the beginning of July.

Chain store sales throughout the country made large gains in September, reaching a new monthly peak for the year to date, with the *Chain Store Age* index at 109, as compared with 106 in August. The index of department store sales compiled by the Board of Governors of the Federal Reserve System, with adjustment for seasonal variation, stood in September at 86 per cent of the 1923-1925 average, as against 83 in each of the two preceding months.

Freight car loadings in the week ended Oct. 8 increased by 5026 to a total of 702,964 cars. This number is 13.5 per cent less than that for the corresponding week last year. The difference between 1938 and 1937 figures thus shown is the narrowest so far registered this year.

Production of electricity by the electric light and power industry in the week ended Oct. 8—based on the first complete returns available since the coverage of the weekly reports was temporarily restricted by reason of extensive storm damage in September—was greater by 0.7 per cent than in the preceding week. This output was 5.5 per cent less than the figure for the corresponding week last year.

Average daily production of crude oil in the week ended Oct. 8 was 3,249,350 barrels, registering a gain of 17,500 barrels above the output in the preceding week. It compares with a current demand of 3,366,800 barrels, as calculated by the U. S. Department of the Interior.

American deliveries of refined copper to consumers in September were 53,637 tons—5000 tons more than in August and more than twice the quantity, 24,881 tons, delivered in January. World deliveries were 190,935 tons in September, as compared with 177,580 tons in August and

with 158,783 tons in September of last year. Prices of the metal here and abroad have increased substantially in the first half of this month.

Contracts let for residential construction in the 37 States east of the Rocky Mountains during September, according to F. W. Dodge Corp., totaled \$99,574,000, or 52 per cent more than the corresponding monthly figure last year. For the entire third quarter of this year residential building showed a gain of 30 per

cent above the corresponding 1937 data.

Domestic consumption of lint cotton in September amounted to 534,037 bales, as compared with 561,406 bales in August. Total consumption made the most favorable comparison with last year's corresponding figure so far shown in the current year.

Professor Fisher's index of wholesale commodity prices for the week ended Oct. 15 stood at 80.3, as against 80.5 in the week preceding.

Member bank reserve balances increased \$79,582,000 in the week ended Oct. 12, bringing excess reserves to an estimated total of approximately \$3,050,000,000, or \$30,000,000 more than they were a week earlier. In the same period bills discounted by the Federal Reserve banks increased \$1,954,000 to \$9,299,000, with bills bought remaining again unchanged at \$541,000.

## Litchfield Urges Wagner Act Revision

*Goodyear Head Suggests Changes in Law Calculated to "Inject Some of the Essential Fairness Which It Needs If It Is to Be Workable"*

A thorough revision of the Wagner Labor Relations Act was urged by P. W. Litchfield, president of the Goodyear Tire & Rubber Co., Akron, when he addressed the annual convention of the National Association of Foremen in Akron, Oct. 15. Mr. Litchfield, whose company has had more than 100 sit-down strikes of rubber workers, including one eight-weeks' strike and one riot in which many were injured and gassed, and which has transferred a major portion of its tire manufacture out of Akron to new subsidiary plants in other states, offered three specific suggestions for changes which he said "would go a long way to inject into the law some of the essential fairness which it needs if it is to be workable."

His proposals were: 1—To give the employer the right to petition the National Labor Relations Board for the designation of the bargaining unit; 2—To permit an immediate appeal to the courts from questionable designations of bargaining agencies; 3—To provide for an appeal to the courts not only on questions of law but on questions of fact.

Declaring these three changes to be absolutely necessary, Litchfield added:

"However, nothing less than a through revision of the law by skilled draftsmen advised by persons knowing something of business, labor

relations and management, will make it the model of progressive legislation which it really should be."

Under provisions of the Wagner act, the United Rubber Workers Union won collective bargaining rights at Goodyear a year ago, since which time the company has had several riotous strikes. Goodyear, however, does not have a contract with the URW, as have Firestone and Goodrich. Negotiations for a URW contract now are pending, but the recently organized Goodyear Independent Employees Association is preparing to petition the National Labor Relations Board for a new bargaining election at Goodyear, with its name on the ballot in opposition to the URW. It claims to have a majority of Goodyear's Akron employees signed up as members.

"The Wagner act, while wise and sound in some respects, has certain glaring deficiencies, and these deficiencies, through their repressive influence over the employer, have made for uncertainty and hesitation," Litchfield declared.

"When we get to this needed general overhauling of the act," he said, "it seems to me that the first effort should be directed toward bringing it into line with basic American traditions of judicial procedure."

"To combine the functions of prosecutor and judge in a single

(Turn to page 494, please)

## News of the Industry

### BUSINESS: PRESENT AND FUTURE

● Dr. Lionel D. Edie, president, Lionel D. Edie & Co., New York, addressed the National Machine Tool Builders Association convention at Hot Springs, Va., this week on the subject "The Business Outlook." He estimated that the automotive industry for the next nine months should be operating at the rate of 3,500,000 units per year. He also predicted definitely that business would be lifted to greater heights than any given period in 1936 or 1937. This is predicted on the current program of controlled currency in which public works expenditures will exceed previous peaks by 30 to 40 per cent.

● Chrysler Corp. has recently increased its production schedules by 20 per cent, K. T. Keller, president, announced on Oct. 19.

"Open orders now on our books call for a total of 137,000 new 1939 passenger cars," he said. "The order situation has improved steadily week by week during the last month indicating an unusual response to the new line of cars on the part of both dealers and the public.

"Current business is brisk and we hope the demand will continue to show such vitality as to make it necessary for us to increase our schedules again.

"Until we get into full production we are getting as rapid retail turnover as physical movement of the cars will permit. Meanwhile stocks of cars in dealers hands are 31,500 as against 98,000 at this time a year ago."

Keller pointed out that since Aug. 1 Chrysler Corp. has recalled 34,000 employees and now has approximately 54,000 men at work in its plants.

"We expect employment to increase right along into November," he said.

### ADVERTISING NEWS NOTES

● Advertising agencies interested in automotive accounts are buzzing with excitement over reports of increases in gasoline sales in New York and other large states during the past summer, and have high hopes that 1939 will show marked increase in the use of cars, trucks, tires, parts, accessories and gasoline and oil. New York reported a gain of 2½ per cent in August over the same month last year. Empire State Travel Association, recently organized in Albany to encourage tourists, will spend \$150,000 with Kelly, Nason & Winsten, agency, and will encourage the state to increase its budget for next year. The state spent \$500,000 this year. The worlds fairs in New York and San Francisco during 1939 are counted on to stimulate motoring.

● Stewart-Warner-Alenite Corp., will drop the Horace Heidt (Chicago) network after Dec. 25, after four years. Hays MacFarland, Chicago, is the agency.

● Pines Winterfront Co., Chicago, has appointed Paul Grant Advertising Agency to handle its sales promotion program.

● Landis & Gyr, Inc., agent for RBM miniature ball bearings, has started an advertising campaign in trade papers for the product which is used in precision instruments. Faust & Sager has the account.

● Frank K. Esherick has been placed in charge of media buying in trade and industrial publication in the new N. W. Ayer & Son, Inc., media department. All phases of the clients' advertising from the selection of the publications and other media to checking copy in the publications now comes under the new department. Harry E. Springmann is in charge of newspapers, and Clarence R. Palmer, magazines. Other members of the media department are Leslie D. Farnath, G. Kirk Greiner, Frederick L. VanLennep, A. P. Williams and Harold L. Wilt, according to an announcement by H. A. Batten, president

of the agency. Harris D. Bootman is director of the department.

● Vagabond Coach Mfg. Co., New Hudson, Mich., has appointed Whipple & Black Advertising Co., Detroit, its agency.

● O. M. Schloss, of McCann-Erickson, Inc., radio department, has been appointed space buyer of publication media for the agency.

● Gardner Advertising Agency, for many years active in the automotive field, marked its thirtieth anniversary in the business. H. S. Gardner, the founder, is still active and predicted a brilliant future for advertising.

● Crude Rubber Development Bureau will undertake to promote and popularize wider uses of rubber in an advertising campaign. The Bureau has its headquarters in the Munsey Building, Washington, D. C.

● Appointment of Joe Foley as assistant advertising manager at Graham-Paige Motors Corp., has been announced.

● The newly-established Technical Advertisers Association of Montreal was presented with a charter recently. The Montreal society will be known as the seventeenth chapter of the National Industrial Advertisers Association.

### GOVERNMENT PURCHASES

● Government purchases of transportation equipment as reported by the Walsh-Healey Public Contracts Board for the week ended Oct. 8 totaled \$2,983,274. Awards follow:

Yellow Truck & Coach Mfg. Co., Pontiac, Mich., \$425,344; International Harvester Co., Seattle, Wash., \$11,046; Adrian Nelson, San Juan, Puerto Rico, \$10,130; General Motors Corp., Chevrolet Division, \$38,170; all for trucks.

The Autocar Co., Ardmore, Pa., \$13,575 for truck chassis; Angelina Chevrolet Co., Lufkin, Tex., an estimated \$10,000 for truck parts.

York (Pa.) Safe & Lock Co., \$1,557,330 for gun mounts; Grumman Aircraft Engineering Corp., Bethpage, Long Island, \$754,400 for airplanes; Kollsman Instrument Co., Inc., Elmhurst, N. Y.; \$135,850 for altimeter assemblies; Douglas Aircraft Co., Inc., Santa Monica, Calif., \$11,798 for airplane parts; National Supply Co., Superior Engine Division, Springfield, Ohio, \$15,630 for propelling engines.

## Labor

### Despite Minor Flare-Ups in Detroit Area Aspect Appears Encouraging

Although there have been several minor outbursts and a few other potential flare-ups have been smoldering, the general labor situation in the automotive industry, and particularly in the Detroit area, took on a more encouraging aspect during the current week.

While negotiations covering a variety of disagreements have been under way between plant managements and representatives of the United Automobile Workers, no serious impairment of production had taken place.

Extensive rehiring programs announced by major car and truck manufacturers have played an important part in cutting down unrest, although there also has been evident a more successful desire on the part of UAW leaders to depend upon negotiations.

A new crisis, threatened by the UAW announcement that it would demand the 32-hour week, appeared to have been averted when General Motors and Chrysler units announced expanded production schedules would require the employment of hundreds of additional workers. At the Plymouth division of the Chrysler Corp., where the 32-hour demand brought the situation to a head, both company officials and UAW leaders announced that plans of the company to add another shift requiring a 20 per cent increase in number of employees, approximately 8000, had settled the dispute.

## Automotive Metal Markets

### Steel Prices Reestablished on Basis Existing Prior to \$6 Per Ton Cut

Reestablishment of the price schedules on hot and cold rolled sheets and strip steel on the basis existing before the \$6 per ton price cut was announced on Wednesday afternoon. Orders placed at the lower prices will, of course, be filled and billed at these, but all fresh business would carry the higher prices.

Flat steel rolling and finishing equipment today accounts for around one-third of the steel industry's total investment in mechanical equipment and consumption of flat rolled steel is crawling up to one-third of the total tonnage of finished steel consumption. As has always been the case, price reductions were made

possible by volume demand and, roughly speaking, flat steel prices today are 40 to 50 per cent lower than when sheets were rolled one at a time or at best in pairs. To some extent, therefore, downtrend in price is explained by the progress made in production and consumption, but what has happened in the last few weeks is the sort of price movement that causes uneasiness no less to consumers than to producers. Automobile manufacturers and parts makers want to buy steel at as low a price as possible, but they are even more concerned about being able to depend upon steel prices continuing on an even keel, so that their own



price policies need not be revamped because of sudden changes in the steel market. Some steel producers still hope that the Public Contracts Board's decision on steel wages paid to labor employed on Government contracts may pave the way for a readjustment of steel mill wage scales generally. This would permit lower sheet and strip prices to be offset in part by pay roll savings. No announcement regarding the price of semi-finished steel descriptions, from which sheets and strip are rolled, has so far been made, the position of non-integrated finishing mills apparently having not come in for consideration since the upheaval in flat steel prices. The rate of employed ingot capacity this week is reported by the American Iron & Steel Institute at 49.4 per cent, compared with 51.4 per cent a week ago, the decline being in part due to somewhat lower primary operations in the Detroit area.

When word came from London that the International Copper Cartel had removed all restrictions on production, the market's tone turned easy. On Tuesday the London wire bar equivalent, which is the price determinant in the world market, was down to 11.15 cents a pound from 11.60 cents on Monday. Here the market was barely steady at 11¼ cents, following sales of 65,000 tons during the first half of the month.

Tin was under the influence of the copper market, in which the International Copper Cartel's action was taken to mean putting up of the bars against runaway market conditions. Spot Straits tin was quoted at 45 cents at the week's opening and little change was noted on Tuesday.

Zinc has been marked up to 5.05, East St. Louis, an advance of \$2 a ton.—W. C. H.

## Ourselves and Government

### FTC Files Ford Brief in "Six Per Cent Case"; South Bend Hearing on Demurrer to Indictment Against GM Set for Nov. 1

A weekly check list of legislative, executive and judicial actions affecting the automotive industries. First appeared in June 25 issue, p. 831. Corrected to Oct. 20.

#### CONGRESS

Adjourned June 16, sine die. All members of House and 36 Senators retire or face election in Autumn.

#### Legislative Legacies

**MONOPOLY STUDY.** Full committee met in Washington on Oct. 13, announced public hearings will begin Nov. 14 or 15, that 89 subpoenas have been served in connection with so-called concentrated ownership of glass patents and Chesapeake & Ohio proxy contest, and that Executive Committee would work out procedure for hearings. Believed committee will recommend establishment of permanent Bureau of Industrial Economics to continue study of nation's economic system.

**WAGES AND HOURS.** Administrator Andrews has issued regulations under which below-minimum rates may be paid to apprentices, learners, messengers and handicapped persons upon application and approval by the Administrator. Borderline industries—those not certain of whether their operations are interstate or intrastate—are being urged to voluntarily comply with the law both for legal and economic reasons. Law is effective Oct. 24.

**CIVIL AERONAUTICS AUTHORITY.** CAA officials held week-long conference in Chicago this week in preparation for the opening of five new airway traffic control stations. Attending were the managers of existing stations and those chosen to manage the new ones; representatives of the Air Transport Association and the Air Line Pilots Association. The new stations, to be opened during the next few months, are located in Salt Lake City, St. Louis, Fort Worth, Atlanta and Kansas City. Existing stations are in Newark, Cleveland, Chicago, Washington, Pittsburgh, Detroit, Oakland and Burbank.

CAA also has set dates (from Oct. 24 to Oct. 29) for the first series of hearings on applications for certificates of convenience and necessity to be required of air transportation companies.

#### DEPARTMENT OF JUSTICE

**SOUTH BEND.** Nov. 1 has been set as a date for the hearing on the demurrer to the indictment against the General Motors

Corp. in the anti-trust case on file in federal court at South Bend, Ind. It is reported that the Ford and Chrysler cases will be dropped subject to the approval of a consent decree by Federal Judge Thomas W. Slick, who will hold hearings on the proposal in the near future.

**AIRCRAFT LABOR.** Walsh - Healey Public Contracts Board studying briefs filed by the National Aeronautical Chamber of Commerce and the A.F.L.'s International Association of Machinists. The next step is for the Board to modify its previous recommendation for a national minimum wage of 60 cents for most employees, 40 cents for learners, if found necessary in the light of testimony taken at a public hearing and information contained in the briefs.

#### LABOR RELATIONS CASES

**N.L.R.B.** has recognized the Amalgamated Association of Iron, Steel and Tin Workers Union, a C.I.O. affiliate, as the exclusive collective bargaining representative for 226 employees at the Ingram-Richardson Mfg. Co., Frankfort, Ind.

#### FEDERAL TRADE COMMISSION

**SIX PER CENT CASE.** F.T.C. cited Ford and General Motors in July, 1937, complaining of false and misleading representations in advertising plans for financing automobiles. F.T.C. brief in the Ford case was filed late last week. (See story on page 487.) In the G.M. case the trial examiner's report has never been made and the Commission may await the outcome of the Ford case before proceeding further.

**VS. GENERAL MOTORS** on question of forcing dealers to purchase parts from G.M. sources only. Hearings, which started in New York on Aug. 16 under F.T.C. Attorney Everett Haycraft, are still in progress.

**FOB PRICES** case vs. G.M. and Ford, in which FTC alleged price advertising was misleading because of failure to include standard equipment. Commission continues to defer setting a hearing date.

**FAIR TRADE PRACTICE** rules for retail automobile dealers, introduced at public hearings during last NADA meeting in December (see A.I., April 30, 1938), are still under study by the FTC fair trade practice division headed by George McCorkle.

**MANUFACTURER - DEALER** investigation under the Withrow Resolution. The investigators currently are going into more states and contacting more firms.

#### INTERSTATE COMMERCE COMMISSION

**MOTOR CARRIER BUREAU.** Effective date of the ICC order of July 12, prescribing hours of service regulations for common and contract carriers of property, has been postponed until Dec. 31. Further hearings will commence Nov. 4, in Chicago.

#### FEDERAL TRADE COMMISSION

**VS. The Perfect Recondition Spark Plug Co., Brooklyn,** and others, charged with unfair competition in the sale of used and reconditioned spark plugs. Hearing resumed at Toledo, Ohio, Oct. 17, before Trial Examiner Miles J. Furnas. Joseph C. Fehr, F.T.C. attorney.

**VS. Vacu-Matic Carburetor Co., Wauwatosa, Wis.,** charged with unfair competition in the sale of an attachment for automobile engines. Hearing resumed at Washington before Trial Examiner Edward J. Hornibrook. R. A. McQuat, F.T.C. attorney.



Acme

**FRANCE'S FIRST** so-called super-highway is now under construction. The new connecting link between Paris

and Deauville will probably be completed within six months. The photograph shows the present stage of construction in Marly Forest.

# News of the Industry

## Wagner Act

(Continued from page 491)

### COMING EVENTS

● Cincinnati has been selected for the 1939 annual convention of the American Foundrymen's Association, with the meeting opening May 15 and continuing through May 18. The 1939 convention will be held without an exhibit and patterned after the successful technical meetings held in Chicago at the Edgewater Beach Hotel in 1927, and at the Royal York Hotel in Toronto in 1935. The entire program will be devoted to technical, management and general interest sessions, shop operation courses, round table discussions and committee meetings, plant visitation and social functions.

● Truck and bus engineering executives will contribute to the activities of the three-day national transportation and engineering meeting of the Society of Automotive Engineers scheduled to be held in New York, Nov. 14-16. Papers to be read are: "Trends in Engine Design," by F. S. Baster, White Motor Co.; "Tire Sizes—Not More But Better," by M. C. Horine, Mack Mfg. Corp.; "Diesel-Electric Bus Drives," by G. W. Wilson, General Electric Co.; "Instrumentation for Maintenance and Test Procedure of Electrical Equipment," by W. H. Yenni, Joseph Weidenhoff, Inc., and W. A. Roberts, Rappuhn Corp.; "New Kinks in Live Truck Operations," by Henry Jennings, *Commercial Car Journal*; "Trends in Commercial Vehicle Spring Suspension," by N. E. Hendrickson, Mather Spring Co.

● At the National Aircraft Production Meeting, held in Los Angeles Oct. 13-15 and sponsored by the Society of Automotive Engineers with the cooperation of the Aeronautical Chamber of Commerce and the Air Transport Association of America, the following papers were presented: "Ten Years' Service Experience with Alclad Materials in Aircraft," by F. C. Pyne, Aluminum Co. of America; "Stainless Steel for Aircraft," by V. W. Whitmer, Republic Steel Corp.; "Measuring Surface Finish in Production," by Dr. E. J. Abbott, Physicists Research Co.; "Interpretation of Magnaflux Indications," by B. Clements, Wright Aeronautical Corp.; "Magnaflux, What Does It Show?" by J. B. Johnson, Wright Field; "Influence of Design on Costs," by H. Christen, Lockheed Aircraft Corp.; "Coordinating Engine Design and Production," by A. H. Leak, Wright Aeronautical Corp.; "Aircraft Accessories as Relating to Safety," R. P. Lansing, Eclipse Aviation Corp.; "Investigation of Vapor Lock in Aviation Fuel Systems," by Dr. O. C. Bridgeman, director, C. F. R. Vapor Lock Project; "Airline Safety Engineering," J. A. Herlihy, United Airlines Transport Corp.; "Safety in the Air," by A. E. Raymond, Douglas Aircraft Co., Inc.; "Insurance Inspection," by J. Lederer, Aero Insurance Underwriters; "A Survey of Mechanical Failures of Aircraft During 1936 and 1937," by G. W. Newton, chief, powerplant branch, Civil Aeronautics Authority; and "Civil Aeronautics—The Act, the Authority and the Industry," by Hon. C. M. Hester, administrator, Civil Aeronautics Authority. Abstracts of some of these papers will appear in an early issue of *AUTOMOTIVE INDUSTRIES*.

● Capt. G. E. T. Eyston, who recently established the world's land speed record of 357 m.p.h., will open the thirty-seventh Annual Scottish Motor Show which is to be held in the Kelvin Hall, Glasgow, from Nov. 11 to Nov. 19.

It is interesting to note that the manufacturers of the Wolseley car were associated in the design and construction of the axle and steering mechanism

of Eyston's "Thunderbolt." Experience gained in this development is said to have been usefully applied by Wolseley to its current production models.

### CONVENTIONS AND MEETINGS

American Finance Conference Convention, Chicago ..... Nov. 10-11  
SAE Annual Dinner, New York... Nov. 14  
National Association of Finance Companies, Annual Convention, Chicago ..... Nov. 14-15  
SAE National Transportation Engineering Meeting, New York, Nov. 14-16  
National Safety Council Meeting, Chicago ..... Nov. 14-18  
American Petroleum Institute Meeting, Chicago ..... Nov. 14-18  
National Industrial Traffic League Meeting, New York ..... Nov. 17-18  
National Standard Parts Association Meeting, Chicago ..... Dec. 2-3  
Congress of American Industry, New York ..... Dec. 7-9  
SAE Annual Meeting, Detroit.... Jan. 9-13

### SHOWS AT HOME AND ABROAD

Hartford, Conn., Automobile Show, Nov. 3-10  
Washington, D. C., Automobile Show, Nov. 5-12  
New York, National Motor Truck Show, ..... Nov. 11-17  
New York, National Automobile Show, Nov. 11-18  
Pittsburgh, Pa., Automobile Show, Nov. 11-18  
Detroit, Mich., Automobile Show, Nov. 11-19  
Philadelphia, Pa., Automobile Show, Nov. 11-18  
San Francisco, Calif., Automobile Show ..... Nov. 11-19  
Columbus, Ohio, Automobile Show, Nov. 12-18  
Buffalo, N. Y., Automobile Show, Nov. 12-19  
Chicago, Ill., Automobile Show, Nov. 12-19  
Milwaukee, Wis., Automobile Show, Nov. 12-19  
Minneapolis, Minn., Automobile Show, Nov. 12-19  
Boston, Mass., Automobile Show, Nov. 12-19  
Los Angeles, Calif., Automobile Show, Nov. 12-20  
St. Louis, Mo., Automobile Show, Nov. 13-19  
Elmira, N. Y., Automobile Show, Nov. 14-19  
De Moines, Iowa, Automobile Show, Nov. 14-19  
New Haven, Conn., Automobile Show, Nov. 14-19  
Omaha, Neb., Automobile Show, Nov. 15-20  
Indianapolis, Ind., Automobile Show, Nov. 19-25  
Baltimore, Md., Automobile Show, Nov. 19-26  
Rochester, N. Y., Automobile Show, Nov. 19-26  
Montreal, Canada, Automobile Show, Nov. 19-26  
Long Island Automobile Show, World's Fair, N. Y. .... Nov. 23-Dec. 4  
Newark, N. J., Automobile Show, Nov. 26-Dec. 3  
Kansas City Automobile Show, Nov. 26-Dec. 3  
National Motor Show of Canada, Toronto, Ont. .... Nov. 26-Dec. 3  
Denver, Colo., Automobile Show, Dec. 5-10  
Automotive Service Industries Show, Chicago ..... Dec. 5-10  
National Motor Boat Show, New York, Jan. 6-14  
Berlin, Germany, Automobile Show, Feb. 17-March 5

board is distinctly unfair and in violation of the principles of democracy.

"Let these functions be separated—let the board function solely as prosecutor. The judicial determinations should be in the hands of our regular courts or, possibly, special courts erected for the handling of such cases and distinctly separated from the board. That is the American way.

"The job of revising the Wagner act in such a manner as to make it really serve the best interests of the nation is only one of the many which must be undertaken before America can get into full stride."

Discussing these three specific suggestions, the Goodyear president asserted that, "until the exclusive bargaining agency has been certified by the NLRB, the employer bargains with any group at his peril.

"In fairness and in the interest of avoiding long periods of turmoil, the act should be amended to give employers the right to petition the board for the designation of the bargaining unit," he urged.

"As the law stands now, the only mechanism provided to test the correctness of the board's designation is for the employer to refuse to bargain with the designated agency.

"Thereupon complaint is filed against the employer and the matter drags along. If the act were amended to permit an immediate appeal to the courts from questionable designations by the board, the employer would be spared expense and uncertainty and his employees would find working conditions more stable."

Asserting that the present law does not require the board to abide by the rules of evidence, and that there is no provision for an appeal to the courts on questions of fact, Litchfield said:

"Thus we find the board in many cases unmoved by the weight of evidence and basing its conclusions upon testimony which would not stand up in the courts of law.

"I believe that the law should be amended to provide for the appeal to the courts not only on questions of law, but on questions of fact."

T. G. Graham, vice-president of the B. F. Goodrich Co., Akron, in addressing the foremen's convention, declared that responsibility and authority of the foreman must be clearly defined and understood as a basis for maintaining satisfactory relationships between employers and employees.



## TOOLS OF TOMORROW

### Crankless Steel Presses

*... Clearing Machine Corp. adapts several non-conventional principles*

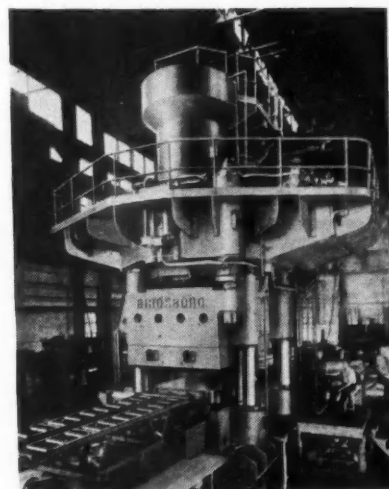
Several interesting improvements have been made by the Clearing Machine Corp., Chicago, on its "Clearing Crankless Steel Presses." A new method for actuating and guiding slides in these machines was described recently in a paper prepared by S. D. Brootzkoos.

Mr. Brootzkoos points out that in mechanical power presses of conventional design the rotating driving member of the press and the slide are connected by a screw adjustable press connection called the pitman. This connection has two movements: one, oscillating with respect to the center line of the press; the other, reciprocating with respect to the bed of the press. Consequently, the slide on its downward stroke, for example, is under the influence of two forces: the vertical or working force which drives the slide downward, and the side thrust which presses it against the back gibs on the uprights. Similarly, the press connection is under

two constantly changing stresses—bending and compression.

A non-conventional principle recently incorporated in the design of the "Clearing Crankless Steel Presses" for transmission of the flywheel energy to the press slide consists in the separation of the movement of the slide from any influences by the horizontal forces which are caused by the oscillating movement of the press connection. This separation was accomplished by making the press connections of two pin-connected parts: the upper part—the pitman, and the lower part—the plunger. While the pitman oscillates in respect to the center line of the press, the plunger has only a reciprocating movement. The slide which is attached to the plungers only is thus relieved by side thrusts by the pitman.

Another non-conventional principle incorporated in the design of these machines is the adaption of all four gibs of the individually adjustable type. The installation of such gibs was possible because in the "Clearing" presses the gibs serve for slide guidance only and not for supporting the slide against side thrusts. The installation of the type of gibbing for the slides was also possible because the slide in these presses is held firmly be-



The hydraulic press pictured above is said to be the world's largest for shearing and forming of airplane parts. It is one of a number now under construction for the Russian Government.

The press has a platen area of 200 by 90 in., a 54-in. stroke, and can exert a working pressure of 5500 tons. Speed and pressure are fingertip controlled and operation can be automatic or manual, as desired. Birdsboro Steel Foundry and Machine Co., Birdsboro, Pa., designed and built the machine.

tween the press uprights, being securely attached to the plungers which are guided by sleeves in the crown of the press. The slides are thus not only guided by the four individually adjustable gibs along the movement of the slide, but also by the plungers and the sleeves located in the crown above the slide.

Some advantages of double guidance of the slide are listed by Mr. Brootzkoos as follows: 1. The large guiding area of the sleeves and the gibs assures more accurate guidance and alignment of the slide and reduces wear and tear to a minimum; 2. The maximum tilt of the slide under uneven loads is always less than the sliding clearance between the gibs and the slide and this eliminates the possibility of scoring the gibs by the slide ways; 3. The gibs, being free from the fluctuating side thrusts caused by the press connection, require less attention and fewer adjustments; 4. The precise movement of the doubly guided slide insures long life of the dies.

The manufacturer of these machines claims that the accurate movement of the slide combined with great rigidity of the steel frame results in better stampings, eliminates costly hand finishing operations, and insures higher output, greater economy in production and lower costs.



Slide of "Clearing" 450-ton, four - point suspension single action press completely assembled, showing the driving gears, eccentrics, pitmans, plungers and the slide adjustment mechanism.

## News of the Industry

### CAR PRICES: 1939 MODELS

• Price reductions ranging as high as \$68 have been announced by Nash Motors on their 1939 models. Nash 1939 factory delivered prices will range from \$770 for the six-cylinder Nash LaFayette special coupe to \$1235 for the four-door, twin ignition, eight-cylinder Nash Ambassador Eight sedan, completely equipped with the new Nash "Weather Eye" Conditioned Air System, cruising gear, and new rubber cushioned seats. Trunks will be available on all 4-door sedans at no extra cost.

• Detroit delivered prices on the new deluxe and custom model De Sotos for 1939 are: DeLuxe Business Coupe—\$870; DeLuxe Coupe with inside auxiliary seats—\$925; DeLuxe 2-Door Touring Sedan—\$930; DeLuxe 4-Door Touring Sedan—\$970; Custom Coupe—\$923; Custom Coupe with inside auxiliary seats—\$978; Custom 2-Door Touring Sedan—\$983 and Custom 4-Door Touring Sedan—\$1,023.

Prices on the 7-passenger and limousine models will be announced later.

• Price reduction on the two 1939 Lincoln-Zephyr body types which account for more than 80 per cent of all purchases have been announced by the Lincoln Motor Co. Price at the Lincoln factory of the sedan with four doors dropped \$15 to \$1360, while the factory price of the coupe-sedan with

two doors was reduced \$25 to \$1330. Prices of the other models are: coupe, \$1320; convertible coupe, \$1700; convertible sedan, \$1790. The coupe price was up \$25. Prices of the convertible models were unchanged.

Prices also were announced for a series of Lincoln-Zephyr models with custom trimmed interiors as follows: coupe, \$1450; coupe-sedan, \$1480; (four door) \$1510; town limousine, \$1700.

• Prices of models comprising the Dodge passenger car line for 1939 show reductions ranging up to \$55 on comparable 1938 Dodge coupe, five-passenger two-door and four-door sedan body types.

Prices as compared with those of 1938 models—in all cases delivered-at-Detroit prices including all federal taxes; transportation and state and local taxes, if any, not included, are as follows:

|                           | 1939  | 1938  |
|---------------------------|-------|-------|
| Coupe .....               | \$756 | \$808 |
| DeLuxe Coupe .....        | 803   | ...   |
| Opera Coupe .....         | 860   | ...   |
| 2-Door Sedan .....        | 815   | 870   |
| DeLuxe 2-Door Sedan ..... | 865   | ...   |
| 4-Door Sedan .....        | 855   | 910   |
| DeLuxe 2-Door Sedan ..... | 905   | ...   |
| 7-Passenger Sedan ....    | 1095  | 1095  |

All 1939 models are of 117-inch wheelbase—excepting the 7-passenger sedan.

which has a wheelbase of 134 inches (132 in 1938)—as against 115-inch wheelbases of the 1938 models.

• Prices of the 1939 Chrysler line are as follows:

Chrysler Royal—coupe, \$918; victoria coupe, \$970; four-door sedan, \$1010; two-door sedan (brougham), \$975; Royal Windsor, \$1075.

Chrysler Imperial—coupe, \$1123; victoria coupe, \$1160; four-door sedan, \$1198; two-door sedan (brougham), \$1165; New Yorker, \$1298; Saratoga, \$1443.

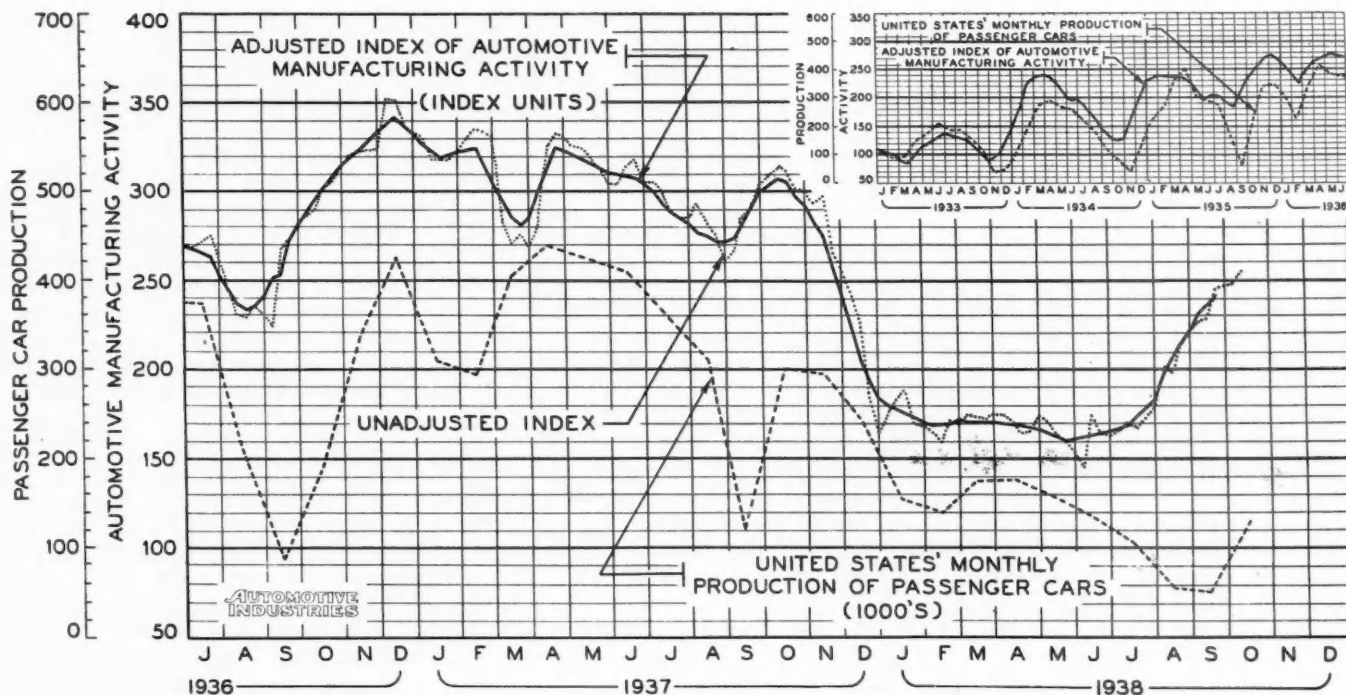
Of those listed, the Royal Windsor and Saratoga are new models in the line this year. Prices for the Custom Imperial line and for two Royals built on a chassis of 136 in. will be announced later. No convertibles are to be built by Chrysler this year.

### CASE DECLARES DIVIDEND

• The J. I. Case Co. today declared a year-end dividend of \$5 a share on the common stock, payable Oct. 24 to stock of record Oct. 12. This is the first payment on the common stock since Oct. 23 of last year when \$6 a share was disbursed.

• Net profit of the Caterpillar Tractor Co. for September was \$364,930, against \$675,019 in September, 1937. Sales for the month totaled \$4,210,047, against \$4,003,324 in September, 1937. For the nine months ended Sept. 30, profit was \$2,072,101, against \$9,135,935 in the like 1937 period. Sales totaled \$37,161,077 against \$54,405,558.

## Heavier Automotive Activity Sustains Upward Trend



A firm foundation for the optimism reported in this week's production summary is disclosed in the automotive curve above, which for the week ended Oct. 15 went to 255 on an unadjusted basis, compared with 249 for the previous week. This was sufficient to preserve the upward character of the trend curve, with only a slight slackening in the general rate of advance.

The overall motor-vehicle assembly rate for the U. S. and Canada, may reach 200,000 during Octo-

ber as indicated elsewhere. For the purpose of the chart, we have estimated passenger car assemblies in the U. S. for the month of October at a conservative 130,000.

Favorable factors continue to multiply throughout the industry, so that the activity curve may continue upward for another three or four weeks, in opposition to seasonal expectations. A reversal of its direction would presage, of course, a substantial drop in the final assembly rate.



# Just Among Ourselves

## A Combination Extraordinary

THE academic facilities of Cornell University and the world flung organization of General Motors' export are combining forces in one of the most interesting experiments to be announced in a long time. The project, which will unite these two normally unrelated agencies, is the publication of an index of world price movements, soon enough after the current fluctuations to make it of tremendous value in forecasting the course of business throughout the world.

In the preliminary workings of the idea, it has been demonstrated that indexes for some countries can be computed and released within five days after occurrence of the prices overseas. To the attainment of this ideal for most of the reporting countries, General Motors' export is devoting its talent for organization, and its many facilities for the rapid transmission of data.

Details of the mechanism are contained in an article in *General Motors World* from which the following details are printed verbatim:

The concept of the index itself is sound and leaves little ground for controversy. It is based on the fact that the influence of prices in any capitalistic economy is dominant and all-pervading. As the determining factor in the process of interchange and distribution, price levels and price movements govern the actions and decisions of the producers and consumers alike with a final and intimate influence on the very food we eat, the clothes we wear, the houses we live in and the amusements we enjoy.

The price structure itself, which plays so dominant a role in our everyday lives, is composed of a wide variety of individual commodity prices. These prices fluctuate widely under the law of supply and demand. If the changes are slow, a minimum of economic disturbance results; if the changes are violent, as they have been in the instance of many individual elements during the last quarter of a century, a reliable index is obviously needed to measure their fluctuation.

Recognition of the importance of this need for reliable price information in determining the probable directional trend of business was responsible for the collaboration of the Gen-

eral Motors overseas operations and the New York State Agriculture College in establishing the routine procedure wherein prices in the various countries could be determined and translated into significant terms. Detailed research and study of the behavior of prices by Prof. F. A. Pearson and the late Prof. G. F. Warren of Cornell University indicated that the prices of certain universal basic commodities are more sensitive to economic conditions and fluctuate far more rapidly, and to a far greater extent, than those of most other goods. These studies were significant in revealing that approximately 80 per cent of the persons gainfully employed in the world are engaged directly in the production, processing and distribution of 40 to 50 of these universal basic commodities and their derivative products.

These few basic commodities, which constitute so important a part of the price problem, move freely in national and international trade and maintain their position as standard staples with few changes from country to country and from decade to decade. Consequently, it was found that any reliable method devised to measure the level and directional trend of the prices of these basic commodities must embrace a consideration not only of their movement in each individual market but also of their movement in the world at large.

Consequently, a list of 40 basic commodities was compiled. This same list was used in each country involved and a world index was computed. However, Professors Warren and Pearson experienced considerable difficulty because of late returns and lack of comparability of data. It remained for the General Motors overseas operations to furnish the requisite mechanism not only for expanding the number of countries included in the index, but also for supplying the current information quickly enough so that the interpretations to be made from it would be applicable to current situations.

The price data involved are purely factual and have no connection with any special monetary theory. The construction of the index and the principles on which it is based have been subject to detailed scrutiny by a number of prominent economists.

All of which is merely transmitted by

—HERBERT HOSKING.

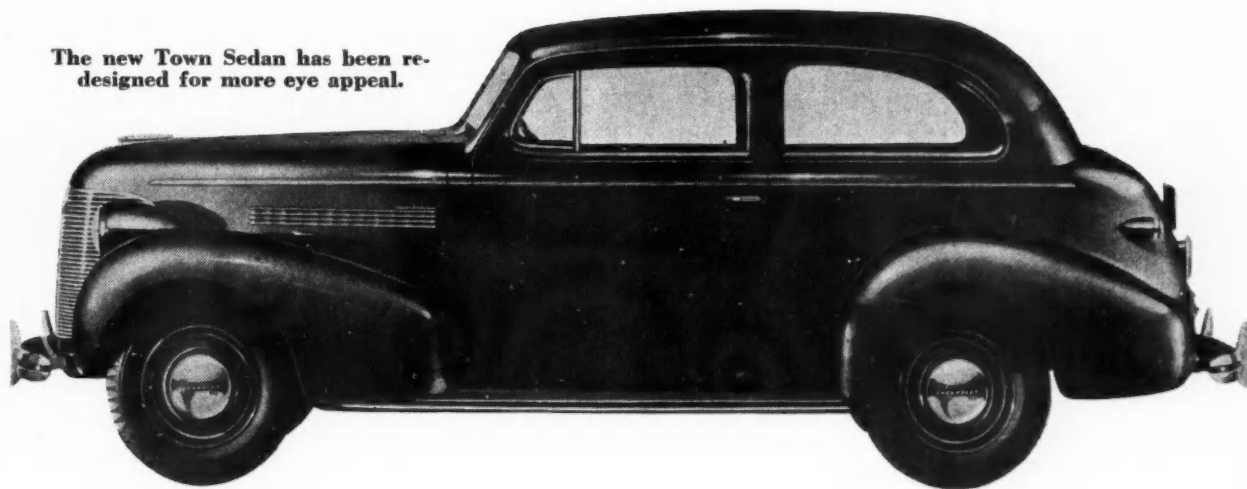


October 22, 1938

*Automotive Industries*



The new Town Sedan has been redesigned for more eye appeal.



## New Front-Wheel Suspension for '39 Chevrolet Line

**F**RESH eye appeal, new Fisher bodies, new sheet metal and new appointments outwardly characterize the 1939 Chevrolet line, which comprises the Master DeLuxe and the Master 85 lines. The differences between the two series are much the same as were those between the two 1938 Chevrolet lines. Body models of the Master DeLuxe line include the sport sedan, town sedan, sedan, and coach, all of which were offered last year, and, besides, a number of new body types. First among these is the four-passenger, two-door coupe, of the five-window type, which

is said to combine the features of the coupe with the luggage capacity of a rumble-seat car. The front seat is of full width and has a split back. In the rear are two opera seats. The new business coupe is identical with the four-passenger coupe in outward appearance, but it does not have the opera seats. In addition, an eight-passenger station-wagon body is offered on both passenger-car chassis.

So far as outward appearances go, the only differences between the two Chevrolet lines are that the Master 85 does not have the stainless-steel running-board molding of the Master DeLuxe, and that the body of the license lamp on the trunk sedans and the business coupe of the Master 85 line is decorated only with a chrome-plated Chevrolet emblem. The model name on the hood louvers reads "Master 85." Bumper guards are available at slight extra cost, except for the rear of the station wagon.

Interiors of the two lines also are much the same, the main difference being that in the Master 85 the instrument panel is in Goodwood beige throughout, the control knobs being mottled brown to harmonize with it, and that the engine heat indicator and the ash receiver are omitted in the Master 85.

Features found in both series include an under-cowl hand-brake lever,

column-mounted gear shift (optional at extra cost), and a redesigned instrument panel with the controls regrouped for greater safety and convenience. All pedals are rubber-covered (which they were not in the 1938 Master line).

The Master DeLuxe now has "knee-action" front suspension by open coil springs and wishbone links, combined with softer rear springs, double hydraulic shock absorbers front and rear, and an effective front stabilizer. The new independent front suspension supersedes the Du-bonnet type used by Chevrolet since 1934.

Mechanically the Master 85 is similar to the Master DeLuxe, except for the fact that the former has conventional front suspension. There are eight body styles in the Master 85 line, six of which correspond to models in the Master DeLuxe series—the sport sedan, town sedan, sedan, coach, business coupe and station wagon. The two styles found only in the Master 85 line are the sedan delivery and the coupe pick-up. The four-passenger coupe is the only model in the DeLuxe series that is not found in the "85" line. The cabriolet of the former Master line has been discontinued.

A simplified steering linkage on the Master DeLuxe, combined with



1. Cut-away view of torsional-vibration damper
2. Steering gear and rubber-cushioned pitman arm
3. Ball-bearing water pump lubricated and sealed for life
4. New distributor valve for regulating lubricant supply to valve mechanism
5. Ventilation of friction clutch
6. Showing hook-up of vacuum cylinder to transmission and shift lever

an increase in the over-all steering ratio from 18.2 to 21.6, makes for easier steering. Column-mounted shift levers are offered as an option at extra cost on both chassis; shifting is by a vacuum cylinder, and the system therefore may properly be referred to as "finger-tip shift."

The Chevrolet engine is a six-cylinder valve-in-head type of 3½-in. bore by 3¾-in. stroke (216.5-cu. in. displacement), which is rated 85 hp. at 3200 r.p.m., with a compression ratio of 6.25. The valve mechanism of the engine has been redesigned for quieter operation. Tappets are solid and have a fine surface on the cam end. Lower ends of pushrods have spherical surfaces. The new water pump has a double-row ball bearing that is lubricated and sealed for life and therefore needs no servicing. Mounting of the distributor has been simplified and a single bolt now serves both as a fastening means and as a means of changing the timing.

A torsion damper of the rubber-hysteresis type is now fitted. As shown by one of the illustrations, it comprises two rings of soft rubber, each with six integral bosses on one face. These rings are threaded over six studs that pass through a retaining metal ring and are riveted into a flange on the hub of the fan-belt pulley, and they carry the inertia member or flywheel, which is completely rubber-supported and driven by the bosses on the rubber rings.

Enlargement of the carburetor balance-vent hole from ⅛ to 3/16 in. is expected to improve the fuel economy, and a similar result was aimed at by a redesign of the heat-control thermostat in such a way as to deliver more heat to the ingoing charge.

Provision for more energetic cooling has been made in the Chevrolet clutch introduced last year. Angular vanes are cast on the rear face of the pressure plate to cause the air to flow outward from the center, and these vanes, together with changes in the contour of the plate, also have increased the cooling surface.

Chevrolet's new "knee-action" front suspension is of the same general type as found on other General Motors cars. It is so designed that it may be assembled and disassembled as a unit. This makes it possible to remove the entire unit, consisting of the springs, wishbone links, stabilizer bar, wheels and tires, without special tools. There are synthetic rubber seals on the bearings of the suspension.

Steering heads have a zero caster angle theoretically, and adjustments

of caster are made by means of the pivot bolt which is threaded inside the knuckle support. Since the pivot bolt is eccentric, turning it also adjusts the camber. Due to a change in camber, the front tread is slightly wider than it was last year.

Steering knuckles now are of the reversed Elliot type. The kingpin is similar to last year's and is fitted with the same bearings, bushings, and thrust ball bearing, but the latter is now located between the lower arm of the yoke and the knuckle support.

On the Master DeLuxe, where both front and rear springs are softer than last year, Chevrolet has adopted hydraulic, double-acting, end-to-end

which are united by two studs passing through rubber bushings. Aside from the linkage the steering mechanism is essentially the same as last year. It is located farther forward, is mounted on the inner side of the frame side rail, and is so arranged that the pitman swings transversely instead of longitudinally. Besides, the worm has a right-hand instead of a left-hand thread. The rubber bushing at the top of the steering jacket has been replaced by a ball bearing of the permanently lubricated type; the latter is rubber-encased to provide insulation for the contact ring of the horn circuit.

The new rear springs have a rate of 120 lb. per in., and the ends of



Seating arrangement of 4-pass. coupe

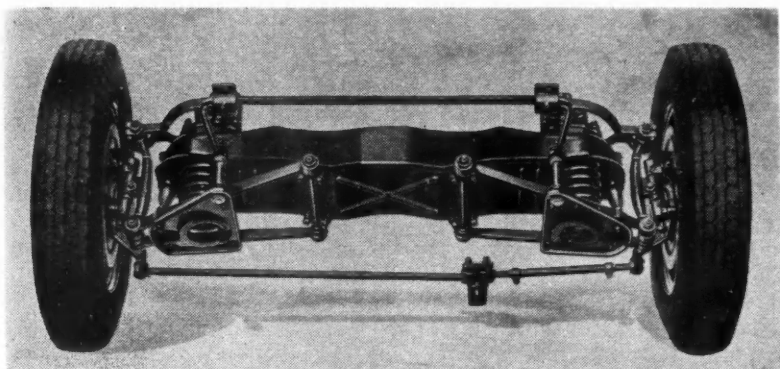
discharge shock absorbers for both front and rear. The stabilizer bar is mounted ahead of the suspension unit, in large rubber bushings under the side rails. Links connect the ends of the sway bar to the lower spring rests. All connections have rubber grommets.

Steering effort is transmitted from the pitman to a two-part tie rod with modified ball-and-socket joints. The ball-and-socket joints of the pitman are placed close to the neutral centers of the tie rods, to eliminate lateral movement and prevent the transfer of road shock. The ball joints of the steering mechanism are of a new design, completely enclosed, self-sealed, and automatically adjusting. The pitman consists of two forgings

their leaves are tapered. Four of the eight leaves are thinner than the others. Front ends of the rear springs have been lowered and rear ends raised, with the object of achieving freedom from rear-wheel chatter on washboard roads.

The optional vacuum-power gear-shift mechanism employs a single vacuum cylinder of the air-suspended type. An obvious advantage of the device is that gear changes can be made manually with the engine dead. Although there is sufficient power to handle the full load of gear shifting, the mechanism has been designed purposely so as to provide enough reaction on the shift lever to preserve a degree of "feel" to the operator.





Details of independent front suspension

The gear-shift lever is a forging that is pivoted on a bracket welded to a torsion tube running parallel with the steering column. Angular motion of the torsion tube transmits fore-and-aft movement to the slider bars of the transmission through the intermediary of a pair of bellcranks and a link. Up-and-down movement for the cross-over is achieved by means of a pushrod mounted within the torsion tube, so supported as to prevent rattling. Here again the motion is conveyed to the transmission by a system of bellcranks and a link.

When gears are shifted, owing to the leverage ratio in the reaction lever, which is in favor of the gear-shift lever, only a slight pressure is required to balance the much greater force due to the vacuum cylinder. So long as the gearshift lever leads the motion, all the levers maintain their relative positions. However, the moment the gearshift lever comes to rest, the vacuum cylinder piston in overtaking it reacts through the idler levers and the reaction levers to force them into a neutral position in relation to the transmission operating lever. This in turn moves the valves in the vacuum cylinder so that engine vacuum is cut off, and, of course, piston travel then ceases. Any further movement of the piston in either direction must then be initiated by the gearshift lever. Air for the vacuum cylinder is drawn through the box section of a frame member and is then filtered by passing through two fine screens and either a fibrous or metallic filter.

A hypoid rear axle is standard, with a gear ratio of 4.222.

Elimination of the speedline, which has characterized Chevrolet bodies during the past two years, permits carrying the body panels straight up, giving slightly more width through the cowl. In the sport

sedan and the town sedan, the body side panels now continue straight back through the trunk. The belt molding crease, which divides the upper and lower parts of the body, starts at the front door hinge pillar, continues back in a straight line, and finally curves up gracefully over the trunk. A new oval-section belt molding with a groove in its center parallels this crease line back to the rear quarter panel, where it terminates. A stripe of contrasting paint fills the groove. To hide more of the chassis, the body panel is carried down 1 in. closer to the ground.

The seat-adjustment mechanism has been redesigned to conform to the new seat-frame construction, and rear seats have been changed to permit of installation of a rear-compartment heater under the rear-seat cushion in all five-passenger models.

As in the past, the front window ventipanes are opened and closed by "remote-control" handles, but for 1939 they are equipped with a sliding bolt lock to prevent pilfering. The lock, located on the lower frame of the ventipane, is not easily seen from outside. It has a spring-loaded knob, and operates by the flick of a finger. Unlocking from the outside is difficult, because the knob must

be pulled against spring tension. All parts of the lock are brightly chrome-plated.

The rear quarter windows no longer pivot like the ventipanes. Instead, on the sedan, sport sedan, and four-passenger coupe, they slide back into the body rear quarter panel. In the business coupe, the rear quarter windows are set into the body. Window movement on the sliding rear quarter windows is controlled by a sliding handle at the lower front corner, which is self-locking at 10 different points along its track.

The Master 85 has conventional front suspension and an I-beam axle. The suspension system includes semi-elliptic leaf springs, direct-acting shock absorbers, and a ride stabilizer. The rear-axle ratio is 3.727, and with this lower ratio the fuel economy is increased but the acceleration is less. On this model a larger cooling fan is fitted, to insure adequate cooling with the lower engine speed, as is also a radiator core of different dimensions. Rear shock absorbers are single-acting. The steering linkage is conventional, but the system includes a balanced-type drag link with sealed, cushioned connections, a steering gear with needle-bearing roller and a ratio of 19 to 1, and a rubber-insulated pitman arm.

Riding qualities of the Master 85 for 1939 are said to be greatly improved. Spring rates are lower at both front and rear, and the double-acting shock absorbers at the front, the ride stabilizer, the rubber-insulated pitman arm, and the spring-loaded drag-link joints combine to give a smoother, more comfortable ride.

Front-spring rates for all Master 85 passenger-car models were reduced from 235 to 175 lb. per in., while those of the sedan delivery were reduced from 310 lb. per in. The spring leaves now are thinner, and they retain the tapered construction which was introduced for front springs last year and is now used in the rear springs as well.

### Tests of Oil for Sludging Properties

There are three standard methods of testing lubricants for their behavior in engines. The Sligh method consists in heating the lubricating oil for 2½ hours to 200 deg. C. in a hermetically-closed phial in the presence of one liter of oxygen and determining the residue formed which is insoluble in ordinary gasoline.

The method of the British Air Ministry consists in heating the oil for twelve hours in test tubes in the presence of an air current and de-

termining the viscosity and the carbon index of the oxidized oil.

The so-called Indiana method consists in oxidizing the oil at 340 deg. Fahr. in the presence of a current of air in a test tube and noting the time which elapses until intense precipitation begins (10 milligrams for 10 grams of oil), as well as the times corresponding to the precipitation of definite quantities between the limits of 10 and 100 mg. for 10 grams of oil.

**F**EATUREING Quadri-Coil suspension, with coil springs at both front and rear, Oldsmobile has developed a smartly-styled line of three models for the new season: The Series 60, a small six of 115-in. wheelbase; Series 70, the big Six, and Series 80, the Eight, both of 120-in. wheelbase.

Styling is entirely new, with a characteristic die-cast front grille and two die-cast side grilles faired into the front fender skirts. While the styling is essentially the same on all models, the 70 and 80 feature new streamline bodies with large glass areas and slender pillars, 2 in. lower than any previous model, and available either with or without running boards. The body for the 60 is smaller and more conventional, and has running boards as standard equipment.

The engine of the small Six is similar to that of the Model 70, except that it has a shorter stroke.

The new mechanical features are common to all models. Gear-shift levers are now mounted under the steering wheel and front compartments have been cleaned up, which permit seating three in front. Standard transmissions are of new design. The improved automatic safety transmission is continued as a basic optional feature on all models. Quadri-Coil suspension with four-way stabilization is undoubtedly the most important mechanical feature of the new Olds line.

With lower chassis frames and curb-entry bodies on the 70 and 80, the hypoid axle has been adopted as standard on all models. This, in combination with a transmission extension, eliminates the former two-section propeller-shaft drive. There are two universal joints in the single propeller shaft. The clutch, which is of conventional design, has been simplified in design, requires fewer service operations, and is said to be more economical to build.

Engines remain substantially the same. Except for its shorter stroke, that of the 60 is interchangeable with the six-cylinder engine of the 70. The 60 engine has a new crank-

shaft which, being designed to take advantage of the latest developments in drop-forging procedure, lowers production cost materially.

The 60 engine is a six-cylinder, L-head of 3 7/16-in. bore by 3 7/8-in. stroke (216 cu. in. displacement) which is rated 90 hp. at 3200 r.p.m., with cast-iron head and 6.2 compression ratio.

The 70 has a six-cylinder L-head engine of 3 7/16-in. bore by 4 1/8-in. stroke (230 cu. in.), which is rated 95 hp. at 3200 r.p.m., with cast-iron head and 6.1 compression ratio.

The 80 engine is an eight-cylinder L-head of 3 1/4-in. bore by 3 7/8-in. stroke (257 cu. in.), which is rated 110 hp. at 3500 r.p.m., with cast-iron head and 6.2 compression ratio.

Engines are mounted on three rubber-to-metal pedestals, one at the front and two at the rear of the clutch housing. The front mounting is of special design, with an interlocking channel section which per-

## Oldsmobile

mits oscillation but prevents fore-and-aft movement. Crankshafts are counterweighted. Bearings are of the steel-back babbitt type, precision interchangeable. Pistons are of aluminum alloy, anodized, with four rings.

A "freeze-proof" by-pass is built into the oil-pump screen and cover, which will by-pass the oil around the screen when it is too viscous to pass through the latter.

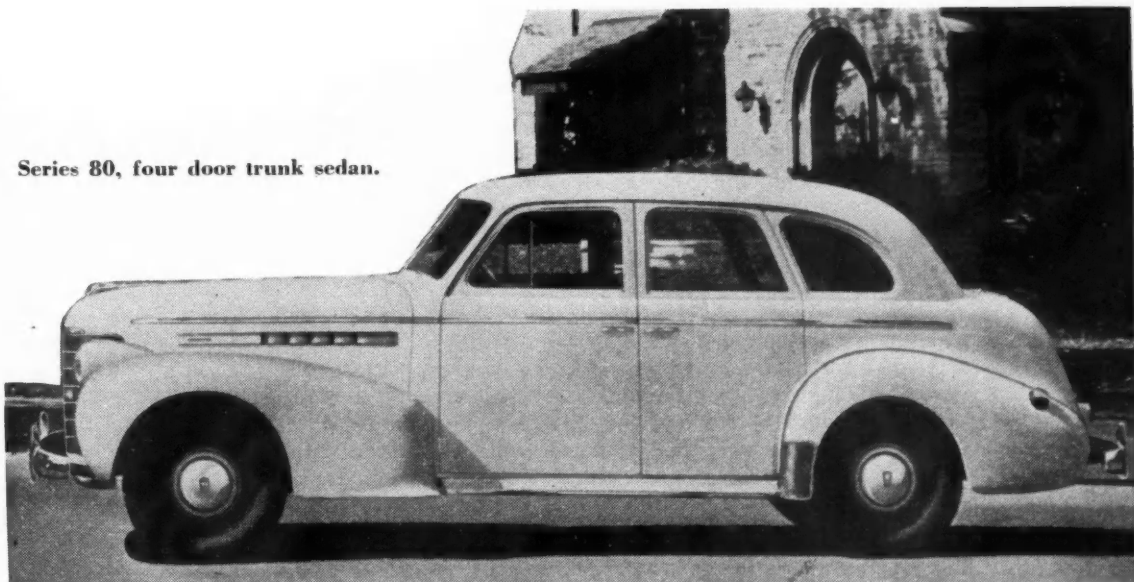
The leak-proof, ball-bearing water pump adopted by Olds last year is



Six series 60, four-door trunk sedan



Series 80, four door trunk sedan.



## Has Coil Springs All Around

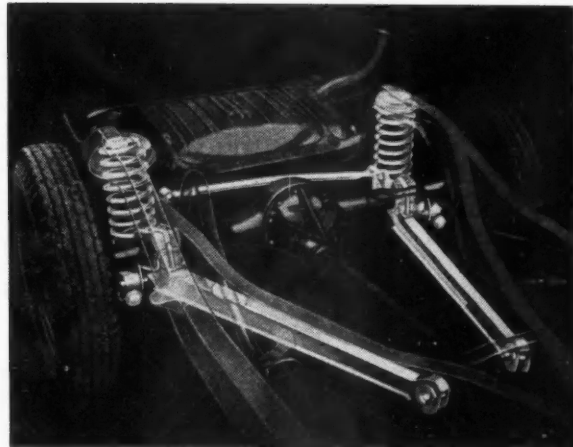
continued. The automatic choke is built into the carburetor and has no external linkage; it is controlled by the temperature of the exhaust manifold. Starting is effected by means of the accelerator pedal.

Vibrator-type voltage control is employed on the fan-cooled generators. Batteries of the 15-plate type, with cells arranged end-to-end, are mounted under the hood on the 60 and 70. The Model 80 is provided with a 17-plate battery. The electrical system is protected by a thermostatic circuit breaker.

With the new coil-spring rear suspension, the brake torque and drive are taken on a rear stabilizer. The arms of this stabilizer, which connect to the axle through rubber insulators, extend back of the axle housing to form seats for the coil springs, and forward for connection to the frame near the X member. These arms, which are approximately 10 in. apart at their forward end, provide a natural stabilizing effect, resisting up and down movement of either wheel.

Sidesway is resisted by a lateral stabilizer bar which is mounted in rubber at both ends. Double-acting shock absorbers of the end-to-end discharge type are mounted on the housing of the rear axle.

Shown here are the rear coil springs and three of the four stabilizing factors



There is a sway bar also at the front end, mounted ahead of the front axle, fully cushioned in rubber at all joints. The front suspension, while of the same general type as heretofore, has been improved in details. For instance, the lower control arms, which formerly were forgings, are now made of heavy channel-section pressed steel. This reduces their weight, makes for production economy, and provides additional ground clearance with the lower frame. The lower arms are pivoted in threaded bearings pro-

vided with rubber seals to hold lubricant and keep out water and dirt.

With the lowered frame level and changes in front-suspension details, it has been necessary to develop a new steering linkage. A link extends from the pitman arm on the left across the car to an idler arm on the right, so pivoted that the link moves parallel to the axle at all times. Short tie-rods connect from the link to each wheel arm.

Olds hydraulic brakes are continued, with 11-in. cast-iron drums  
(Turn to page 506, please)

**H**UDSON'S comprehensive line for 1939 includes the "112" with 112-in. wheelbase; the "Six" with 118-in. wheelbase, the Country Club Series (a six and an eight on the same 122-in. wheelbase chassis), and the Custom Country Club Eight with 129-in. wheelbase.

Styling is new and distinctive, featuring novel front-end treatment with die-cast center grille and two side-mounted die-cast grilles on all models except the 112; new fenders and sheet metal, and a new treatment of body rear ends.

In addition to the passenger-car lines, Hudson will offer a commercial line on two chassis, of 112 and 119-in. wheelbase respectively. Mechanical features of these chassis are identical with those of the passenger cars of like wheelbase. Both commercial lines will include cab, cab-pickup, and panel-delivery bodies. There will be also utility-coach, utility-coupe and station-wagon bodies for the 112-in. chassis, while the 119-in. series will include a sedan.

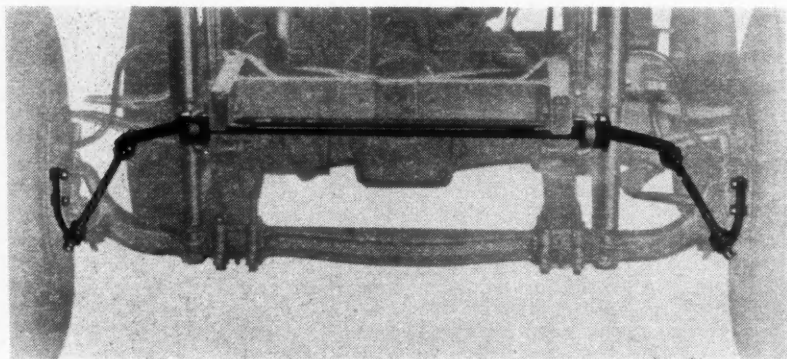
All Hudson models may be had with a composite seat construction in

which an air-foam cushion is applied over the conventional seat cushion. This feature will be advertised as providing the "air-foam ride". Column-mounted shift levers are standard on all models, while the Bendix "Electric-Hand" powershift is optional as an extra on all models except the 112. The automatic clutch is now available on all models.

In a new front stabilizer the links connect to the steering knuckles instead of to the axle bed. All models now come with the "safety" hood first introduced on the 112, in which the one-piece hood panel is hinged at the front and lifts at the cowl, which is the exact reverse of the conventional arrangement. Opening, closing and latching of the hood are effected by means of a lever at the left side of the instrument panel.



Hudson 112, six passenger touring sedan on 112 in. wheelbase and with 86 hp. engine



Hudson Auto-Poise control designed to hold the front wheel in true direction

The 112 has a six-cylinder L-head engine of 3-in. bore by 4 $\frac{1}{8}$ -in. stroke (175 cu. in.), rated 86 hp. at 4000 r.p.m., with cast-iron head and 6.5 compression ratio. The rating of this engine has been increased 3 hp. over last year, which was made possible by improvements in the carburetor, including a larger throat.

Equipping the "Six" is a six cylinder L-head engine of 3-in. bore by 5-in. stroke (212 cu. in.), rated 96 hp. at 3900 r.p.m., with cast-iron head and 6.25 compression ratio.

The Country Club six carries a six-cylinder L-head engine of 3-in. bore by 5-in. stroke (212 cu. in.), rated 101 hp. at 4000 r.p.m., with cast-iron head and 6.25 compression ratio.

The Country Club Eight and Custom



# Hudson—

*enters the 1939 season with four series ranging from 86 hp. on a 112 in. wheelbase to 112 hp. on 120 in. wheelbase*

tom Eight have an eight-cylinder L-head engine of 3-in. bore by 4½-in. stroke (254.5 cu. in.), rated 112 hp. at 4200 r.p.m., with cast-iron head and 6.25 compression ratio.

Carburetors on all models now are fitted with a vacuum step-up metering pin and with fuel screens.

On the larger models the side-mounted radiator grilles improve the cooling. The front-end sway bar, mentioned earlier, is mounted in two molded-rubber bearings, and the linkage has been changed, the lower ends of the links now connecting directly to the steering knuckle forgings. Rubber is used at all joints, of which there are ten, if the two bearings are included. It is claimed that this arrangement eliminates all wheel fight, shimmy and cross-wind effect, without adding appreciably to the steering effort required, and that it tends to reduce over-steering in fast cornering and on the straight-away.

Solid steering wheels are standard on the 112 and Six, but flexible-spoke

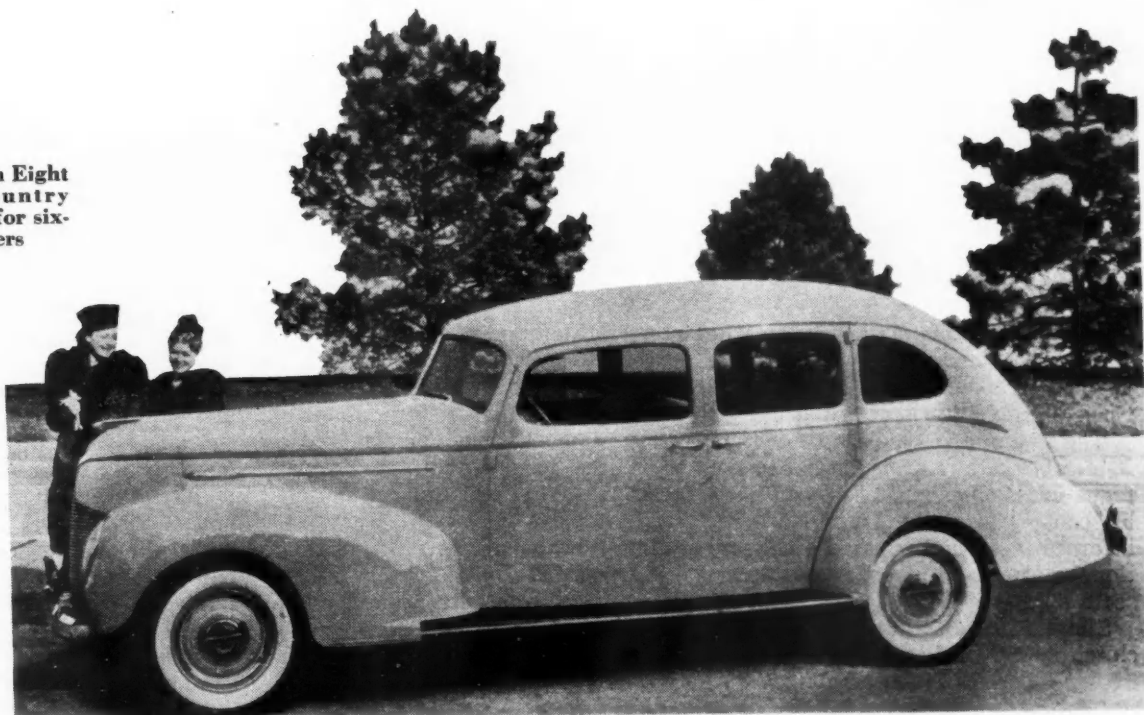
wheels may be had on the Six. All other models come regularly with the modern plastic, flexible-spoke steering wheels.

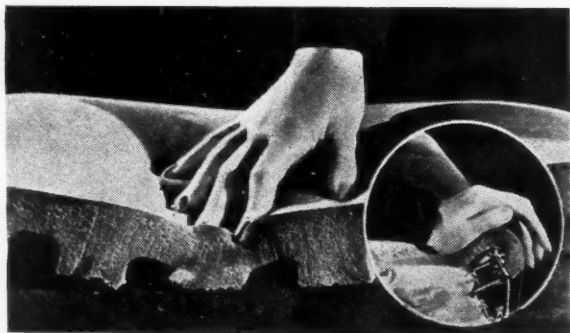
Rear axle improvements include the provision of a heavier and more rigid malleable-iron carrier casting, larger pinion bearings, and larger differential side bearings. Hudson now offers an interesting variety of features in transmission-control equipment. First comes the "remote control," which is standard on all models. A Bowden wire mechanism is used for the cross-over movement. The Bendix Electric Hand is optional on all models except the 112. The transmission has a new cover and shift mechanism for the "remote-control" hook-up, while the cover

for the Electric Hand remains unchanged. The automatic clutch is an optional extra on all models with remote control or power shift.

Smart new styling is characteristic of all models, and is achieved by the use of new sheet metal at the front end. All models feature three radiator grilles of die-cast zinc—a center grille, and two front-mounted side grilles. Bodies for all models remain substantially the same but the rear panel treatment on bodies other than those of the 112 line has been modified to accommodate the roomier luggage compartment provided this year. The luggage space has been increased by about 8 cu. ft., and provision has been made to mount the spare tire upright against

1939 Hudson Eight Cylinder Country Club sedan for six-passengers





The Airfoam seat cushion offered on Hudson models for 1939

the wheelhouse, so it may be gotten at without disturbing the nested luggage.

A fresh-air heating system has been developed for Hudson by the Eaton Mfg. Co. The fresh air unit is attached under the cowl ventilator opening and takes all air from the outside through this opening.

Six and seven-tube radio receiv-

ing sets with automatic push-button control are available. In the Air-Foam seat cushions the molded rubber section with its cored passages, all inter-connected throughout, is needle-pricked after assembly so as to assure complete breathing action. It is said to be unusually cool in the hottest weather, and an aid to comfort on long trips, due to the low

unit pressure on the seat top.

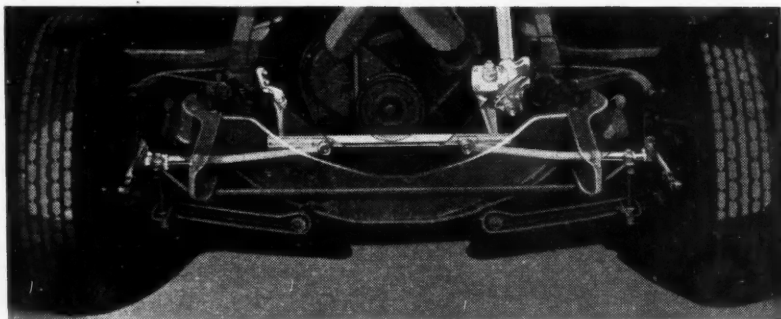
Country Club models have hood side lamps faired into the hood louver molding. Front window ventilators differ with the models. On the 112, the front ventilator is a pivoted wing lever operated as before. On the Six, the front window is fitted with a swinging wing section operated by a crank. On the Eights there is a swinging section which rises and drops with the window.

Tire sizes have been stepped up on some models. On the 112, the tires now are 6.00x16—on passenger cars only. On the Country Club, the tire equipment is 6.25x16, while the Eight is fitted with 6.50 tires.

A twin rear window wiper is offered for the first time. Hudson also makes available the special Trico equipment for windshield cleaning, in which the windshield wipers are supplied with a cleaning fluid from a reservoir.

## Oldsmobile Has Coil Springs All Around

(Continued from page 503)



The Oldsmobile dual center steering control

on both Sixes, and 12-in. on the Eight. The hand brake operates on the rear drums through a mechanical linkage employing steel cables.

The new frames have an I-section X-member whose arms extend to the front cross member. For convertible coupe bodies the frames are reinforced, a special pressed steel section being fastened over the center section of the X-member.

Simplification in the design of the clutch is due to the adoption of a carbon-block throwout bearing. A

new, lighter-type of clutch disk is employed. Clutch-pedal pressure has been reduced by the adoption of an over-center clutch-spring mounting.

The same hypoid axle is used on the three models, with a standard gear ratio of 4.3 and an optional ratio of 4.55.

The new gear shift mechanism comprises a control lever on the steering column, with a ball joint at its inner end, pivoted in the housing for up-and-down movement for the "cross-over". The one shaft oper-

ates both the gear shift and cross-over mechanism, the latter being accomplished by means of a simple Bowden wire connection. The new synchro-mesh transmission is slightly shorter and lighter but more rigid. However, the gear sizes and torque capacity remain the same as before.

Bodies of the 70 and 80 lines are entirely new; they are wider and roomier, have new lines, and provide greater visibility, due to narrow pillars. All door hinges, except those at the bottom of the front doors, are of concealed type. Alligator hoods with counterweighted hinge mechanism at the cowl are standard, the hood sides being fixed. The special safety latch employed is operated by a handle at the lower end of the front grille, instead of by the usual radiator-ornament locking handle. At the rear, a combination trunk lock and license-plate light is housed in a novel die casting. All models have a new safety instrument panel with recessed control knobs. Bodies are provided with adequate acoustic and thermal insulation and with weather seals on all doors and windows.



# Four-Ball Test of E.P. Lubricants

*gives a measure of the protection against seizure afforded by these lubricants. Correlates well with tests on hypoid-gear axles*

**A** NEW method of determining the protection against seizure afforded by extreme-pressure lubricants was presented in a paper by H. Blok of the Delft Laboratory of Royal Dutch Shell at the S.A.E.

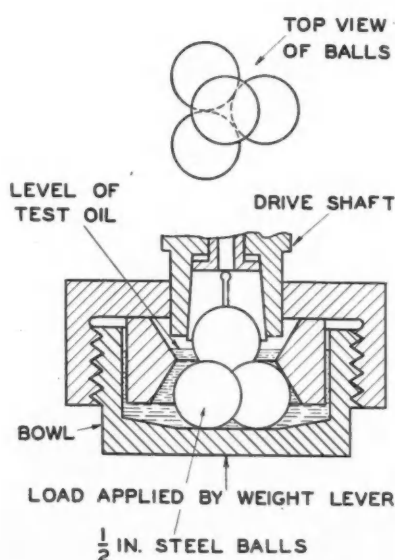


Fig. 1—Principle of the four-ball method.

fuels and lubricants national meetings. Mr. Blok said it is the temperature and not the specific pressure which is the most important of the factors determining seizure in bearings lubricated by E. P. lubricants. A distinction is made between the "bulk" temperature, that is, the average temperature of the parts lubricated as a whole, and the "flash" temperature, that is the momentary temperature at the surfaces of con-

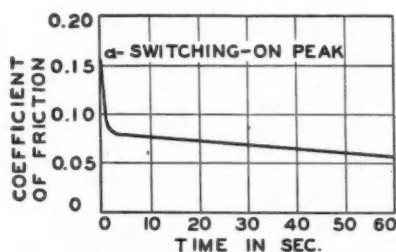


Fig. 2—Friction diagram; no seizure.

tact. With E. P. lubrication of gears the flash temperature is always much higher than the bulk temperature. In present-day conventional test methods for the determination of the protection against seizure afforded by E. P. lubricants, there is generally a considerable rise in the bulk temperature, as this cannot be accurately controlled, hence the margin for the flash temperature is uncertain. In the "seizure-delay" method proposed in the paper the effects of a variable bulk temperature are eliminated, and only the effects of the temperature flash remain.

The four-ball apparatus for test-

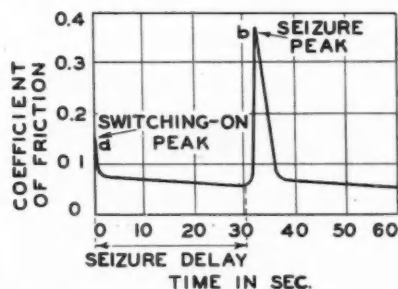


Fig. 3—Friction diagram; seizure.

ing E.T.P. properties, which was invented by the late G. D. Boerlage, director of the Delft Laboratory, is illustrated in Fig. 1. It eliminates the wedging action, and hence the influence of the viscosity of the lubricant. Three balls, clamped together in a bowl, are immersed in the oil or grease to be tested. A fourth ball is automatically clamped in a chuck fixed in the lower end of a shaft driven by a 1½-hp. motor which attains its rated speed of 1450-1500 r.p.m. in a few tenths of a second. This top ball is vertically above the center of the triangle formed by the three underlying balls. In any given test a new set of 1½-in. S.K.F. hardened chromium-steel balls is used, and the load on the balls remains constant. The vertical load on the bowl can be varied between

the limits of 22 and 1760 lb. by means of a weight lever pushing the bowl upwards. The load is applied before the motor is started. The sliding velocity at the surface of the balls is about 1.9 ft. per sec.

The diameter of the circular static indentations on the balls caused by the load before running has been found to vary between 0.0075 in. at 22 lb., and 0.032 in. at 1770 lb., which values correspond with the results obtained from the application of the well-known Hertz formula. Accordingly, the mean specific pressure produced varies from 100 to more than 400 tons per sq. in. The resulting maximum stresses are approximately equal to the yield value of the steel ball.

The bowl being placed on a small thrust ball bearing which permits a horizontal displacement, ensures in the first place automatic centering of the underlying balls with respect to the top ball, so that the load will be evenly distributed over the three "points" of contact; moreover, the friction torque exerted on the underlying balls can be measured sufficiently accurately. The friction measurement can be carried out by connecting the arm fixed to the bowl to a recording mechanism; the coefficient of friction for each load can then be read directly from the diagram.

By the seizure-delay method, the

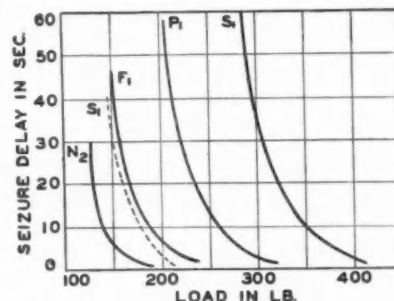


Fig. 4—Seizure-delay curves for different lubricants.

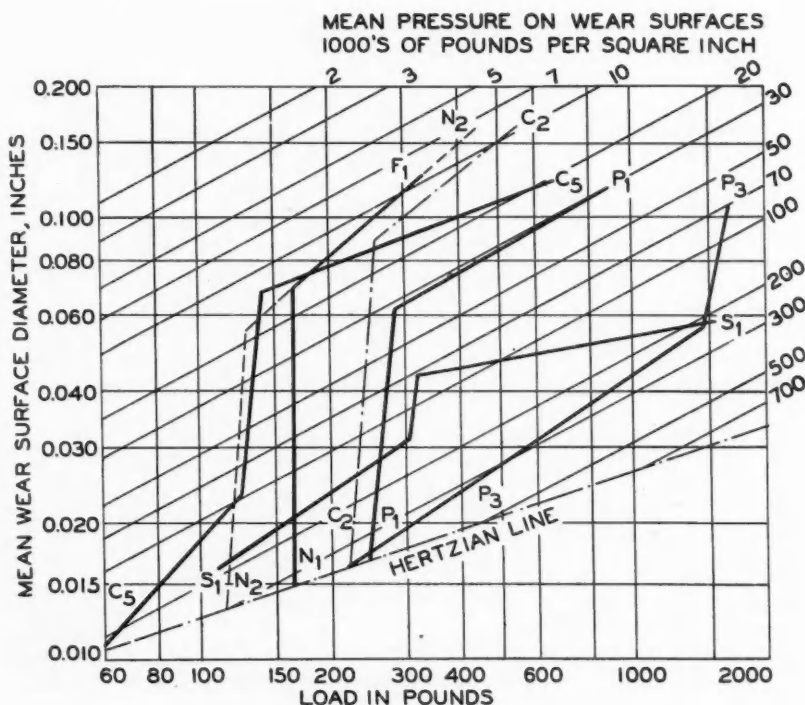


Fig. 5—Wear curves for different lubricants

protection against seizure afforded by the oil under test is evaluated from the results of a series of one-minute tests, each at constant load. It is usually found that—

1. At relatively low loads there is no seizure. This case is represented by Fig. 2. After the initial friction peak, due to switching on, the friction coefficient remains practically constant, between 0.05 and 0.10. In this case the mean diameter of the circular scars produced on each of the lower balls after one minute is equal to the static indentation at the beginning of the test.

2. At higher loads seizure may occur within one minute with an intensity and at a load that are dependent on the properties of the lubricant under test. Generally, seizure occurs only once during a test, but it may repeat itself; it is apparent from a seizure peak in the friction diagram, the coefficient sometimes reaching values of 0.2 to 0.5. (Fig. 3). It is invariably found that the time from the start of the test to incipient seizure—the so-called seizure delay—decreases with increasing loads. In Fig. 4 this seizure delay has been plotted against load for various lubricants tested. The numbered symbols N, S, Cl, P, and C refer to different lubricants belonging to the following groups: N, straight mineral oils; S, lubricants containing sulfur and sometimes lead and chlorine; Cl, lubricants containing chlorine; P,

lubricants containing phosphorus; C, lubricants containing dopes without active elements such as S, Cl, P, etc.

The load at which the seizure delay amounts to 2.5 sec.—the so-called 2.5-sec. seizure load, read off from the averaged seizure-delay curves—is taken as a measure of the protection against seizure afforded by the lubricant under test, and has been found to tally satisfactorily with the results of seizure tests on actual hypoid gears. As a rule, seizure delay curves of different lubricants form a family of curves and do not intersect, although there are exceptions to this. For any given load, as long as no seizure occurs the weight lever does not drop perceptibly, proving that the mean wear-surface diameter of the lower balls remains constant and equal to the initial static indentation. Also, in most cases seizure lasts for a few seconds only, after which a state of equilibrium is reached in which the friction is only slightly greater than at the start. From that point on, the mean wear-surface diameter remains practically constant, hence most of the wear occurs during seizure, and the mean wear-surface diameter, therefore, may be regarded as a measure of the intensity of seizure. The amount of steel removed from the underlying balls is substantially proportional to the fourth power of this diameter. In Fig. 5 the mean wear-surface diameter is plotted against load for the same lubricants as in Fig. 4. A double

logarithmic diagram is used, which makes the wear curves straight lines. It will be seen that for each lubricant the wear curve starts more or less steeply from the Hertzian line, which latter gives the relation between the diameter of the static indentation and the load. At higher loads the steepness of the wear curves decreases suddenly, the transition usually occurring at between 20 and 40 lb. beyond the 2.5-sec. seizure load. This transition point may become important where the friction peaks due to seizure are not very pronounced and some doubt therefore may arise as to the exact value of the 2.5 sec. seizure load.

It follows from the foregoing that until seizure occurs the mean specific pressure at the contact surfaces on the balls usually remains constant, and this is an important advantage of the test procedure used.

3. At still higher loads seizure may not be followed by a state of equilibrium, and the heat produced on the contact surfaces in combination with the high specific pressure may result in the four balls being welded together. The lowest load at which welding has been observed with the different lubricants is indicated in Fig. 5 by a vertical arrow.

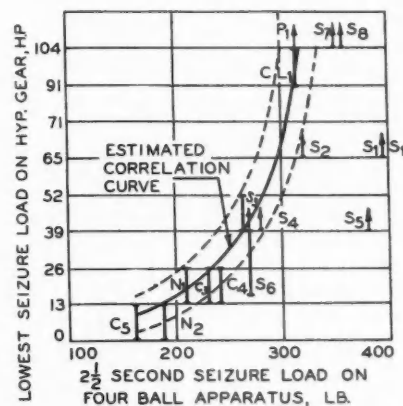


Fig. 6—Correlation between results of four-ball test and tests on Chevrolet hypoid-gear axle.

While the seizure-delay curves are the most important test data, in some cases the wear curves also are quite important, in that they serve to clarify peculiar phenomena. For instance, commercial hypoid-gear lubricants known to behave satisfactorily in practice sometimes give a seemingly low 2.5-sec.-seizure load; as low, in fact, as the undoped mineral-base oil. In these cases, however, the seizure intensity, as determined from the wear curve, is invariably relatively low. Intense seizure occurs only at much higher



loads. Of the two separate delay curves found (see curves  $S_1$  in Fig. 4 and compare them with  $S_1$  in Fig. 5) the one in the higher-load region gives the true 2.5-sec.-seizure load.

Comparisons were made between the 2.5-sec.-seizure-delay and the results of the S.A.E. and the Timken lubricants-testing machines, and it was found that there is practically no correlation whatever. This is readily explained by the fact that in these machines considerable bulk heating of the test pieces takes place, which depends on various uncontrolled factors, whereas in the Four-Ball apparatus the effects of bulk heating are eliminated and the effects of the temperature flash are brought out.

Seizure tests were made also on a Four-Square set-up of a Chevrolet 1937 85-hp. hypoid rear axle, at a speed corresponding to 40 m.p.h. road speed. For most lubricants tested the load was increased 13 hp. at the end of each hour. In Fig. 6 is plotted the lowest load causing seizure for each of the lubricants tested. The upper and lower ends of the vertical lines indicate the limits of the load region within which the true "lowest load at seizure" on the hypoid gears must be situated, and the vertical arrows refer to those lubricants which cause no seizure on the gears up to the highest test loads indicated, to which these lubricants were subjected.

The author points out that a better correlation could hardly have been expected. It may be inferred from Fig. 6 that from the standpoint of protection against seizure under the above-mentioned conditions, only those lubricants were satisfactory that showed a 2.5-sec.-seizure load higher than 140-150 kg. (310-330 lb.

some assembly operations in Canada and the new Willys company to get started.

While a definite decision is still lacking, it is believed that some of these companies after investigation are convinced that it is still cheaper to bring in completed cars over the 17½ per cent duty than to import a long range of parts free and assemble in Canada. The only solution advanced in such quarters, it is understood, would be to increase the

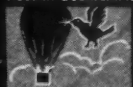
duty on completed cars. Such a step by the present government at Ottawa, Ont., however, is considered most remote.

One or two of the companies mentioned however, especially those which have large plant investments in Canada and assembly experience in that country, hope to benefit. Hudson has officially stated that it expects to enlarge manufacturing operations at Tilbury, Ont., and put more men on its wage roll.

# 200,000 service men can't be WRONG

Last Spring hundreds of lubrication outlets were contacted by personal call as a follow-up on two years of intensive advertising by Acheson. In this survey, use of "dag" colloidal graphite in crankcase, top cylinder and spray oil was covered. But what we really wanted to know was—is there a need for a rubber lubricant? The answer was emphatically "yes". We found squeaking rubber parts to be the "pet peeve" of the grease rack attendant. No matter how carefully he does his work, there are "come-backs". In desperation, he has even tried spraying brake fluid on offending points—it will keep them quiet for a while. Realization of this and the fact that a solution must be provided with a non-petroleum product led Acheson to the working out of form-

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ulas, which have been patented, in which "dag" colloidal graphite is the basic part. The extremely minute particle size of the graphite assures ready penetration. The presence of this solid lubricant is the one reason why squeaks stay away longer than with a product minus this material. Added to these benefits is the ease of applying a rubber lubricant containing "dag". Any standard spray gun is suitable and for hard-to-get-at places a needle spray gun can be used to advantage. Selected marketers may blend a "dag" colloidal graphite rubber lubricant of their own or purchase a ready-for-use product from concerns who will package under the marketer's own trade-mark. We will gladly supply the names of several such companies. Send for folder.

## Canadian Assembly of U. S. Cars Follows Tariff Change

All independent automobile manufacturing companies may not be lured back to Canada as a result of the recent more favorable tariff ruling. A few weeks ago the Canadian Government widened free import of automobile parts to three manufacturers turning out less than 10,000 cars a year. Formerly, for this group to qualify for the free import privilege, Canadian content including labor cost of the completed vehicle had to be 50 per cent. Now it is 40 per cent. This move, it was expected, would make it possible for such companies as Hudson, Studebaker, Packard and Graham to re-

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